


Communicating climate change in the current digital ecosystem: the viewpoint of experts and media strategies

Comunicar el cambio climático en el actual ecosistema digital: la opinión de los expertos y la estrategia de los medios



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Abstract:

This research addresses the main challenges involved in communicating environmental issues in Spain and Portugal. To this end, the authors consulted 23 experts in the fields of both science and environmental communication, in addition to administering 100 surveys to media outlets. The study is based on the premise that closer ties between the scientific community and news professionals is the key to improving the dissemination of the causes and consequences of climate change, as well as providing a suitable context for environmental issues. The results highlight specific proposals from the expert community, including strategies for diversifying formats and specializing in environmental coverage. Nevertheless, media executives take a more cautious stance, expressing doubts about the feasibility of implementing these changes in newsrooms.

Keywords:

Communication; climate change; environment; scientists; media.

Resumen:

Este estudio aborda los principales desafíos en la comunicación de temas medioambientales en España y Portugal, mediante la consulta tanto a expertos en comunicación científica y medio ambiente (23), como a los propios medios de comunicación (un centenar de encuestas). La investigación se basa en la premisa de que un mayor acercamiento entre la comunidad científica y los profesionales de la comunicación es clave para mejorar la difusión de las causas y consecuencias del cambio climático, así como para proporcionar un contexto adecuado a las cuestiones medioambientales. Los resultados señalan propuestas específicas por parte de la comunidad experta, que incluyen estrategias como la diversificación de formatos y la especialización en la cobertura medioambiental. Sin embargo, los directivos de medios adoptan una postura más reservada, expresando dudas sobre la viabilidad de implementar estos cambios dentro de las redacciones.

Palabras clave:

Comunicación; cambio climático; medio ambiente; científicos; medios de comunicación.

1. Introduction

With widespread access to content nowadays, communicating science and environmental issues is no longer a monopoly of the media. Content platforms and social media have become the most widely used channels for queries about science issues, followed by institutional websites (Díaz-Catalán & Cabrera-Álvarez, 2022). However, trust in these sources is an ongoing issue. Reports indicate that society has received dubious and false information on issues related to health and climate change, precisely through social media.

The topic areas where false content arise are varied. There are certain fields where hoaxes proliferate and where disinformation can do more damage. This is the case with information related to health and the environment, as these two issues are closely connected, as confirmed by studies published in recent years, both before (Whitmee et al, 2015) and after the COVID-19 pandemic (Watts et al, 2021).

“Rhetoric and misleading information about climate change and the deliberate undermining of science have contributed to false perceptions of scientific consensus, uncertainties, ignored urgency and risk, and dissent”, as noted by the Intergovernmental Panel on Climate Change (IPCC) (Hicke, 2022, p.1939). In fact, despite a sound, scientific consensus on the effect of human activity on climate change, interest groups who try to promote a counter argument are gaining prominence (Koop & Dinerstein, 2022).

Furthermore, the complex nature of climate change makes communication difficult, which is also influenced by “factors related to human perception or psychology”, according to Sánchez Olgado et al. (2024, p. 299). These authors point out the need to consider both the scientific aspect of the phenomenon, as communication professionals have the task of making science understandable, as well as the social realm. The latter domain refers to ideological, economic and political motivations that can have a detrimental effect on the values of democratic social debate. Studies on the social network X (Vosoughi et al., 2018) and YouTube (Allgaier, 2019) have shown that videos supporting the scientific view on climate change and those that did not receive roughly the same number of views.

Given this complex communication scenario, the present study aims to analyse the main challenges facing environmental communication in Spain and Portugal by consulting experts working on the Iberian Peninsula in areas related to both the environment and science communication. The thesis that underpins this work is based on the idea of bringing the scientific community and communication professionals closer together, which we see as an effective strategy for identifying proposals to improve the dissemination of information related to the causes and consequences of climate change. The overall objective of the foregoing is to provide an appropriate context for environmental issues. The goal is for science and technology communication to reach its full potential at a time when the planet urgently needs truthful communication (Jensen & Gerber, 2020).

2. State of the issue

2.1. *Communicating information on the climate crisis in the digital age*

Since the 1970s, the temperature has risen faster than in any previous 50-year period. A report by the UN Environment Programme (UNEP), entitled Emissions Gap 2022, predicts that current policies will result in a 2.8°C rise in global temperatures by the end of the century and warns that halting this increase will require a large-scale, rapid, and systemic transformation. Furthermore, the IPCC Synthesis Report (2023, p.42) states “unequivocally” that human activity, which generates greenhouse gas emissions, is responsible for the current global warming situation. In fact, nearly 80% of these emissions come from the following areas: energy, industry, transport, and construction. There are several obstacles to addressing this problem: a lack of resources, limited commitment from businesses and society, low funding, and a lack of commitment from companies and governments.

Moreover, this panel of experts stresses the need to improve the climate information available to the public. This challenge presents an opportunity, because at the same time issues related to scientific advances are reaching citizens in greater numbers, who are increasingly aware that their quality of life is impacted by new developments. However, issues directly or indirectly related to the environment represent a specialised field of journalism with its own specific characteristics and history. Its close relationship to economic development makes it a subject that tends to be manipulated and politicised. The problem is further exacerbated by the fact that much of the news coverage is negative, alarmist, or taken out of context. Despite mounting scientific evidence and greater awareness (European Commission, 2021), global warming continues to be denied or trivialised. Since 2018, the emergence of social movements has intensified the urgency of the message, which has had a significant impact on social media (De Lara et al., 2022). Such movements include the following: the student activist crusade known as Fridays

for Future (led by the well-known young activist Greta Thunberg); the social movement called Extinction Rebellion; and other environmental organisations and groups comprised of teachers, mothers, celebrities, climate researchers, and others. While the number of people speaking out on the topic of science and the environment has multiplied with the advent of social media, new actors have burst on the scene along with the multitude of other voices creating content about climate change, not all of whom act in accordance with ethical standards or rigorous reporting. While in media communication, the microphone is usually given to politicians and associations, the protagonists on social media are very different (Sánchez-Holgado & Arcila, 2020).

As pointed out by Núñez & Campo (2024, p.147), communicating the observed effects of climate change and its future predictions must be a priority in communication, as climate change is one of the most serious challenges facing civilisation today. Far from demonising the role of social media, these authors emphasise that its emergence coincides with a period of heightened awareness about the consequences of climate change in Spain, and they see it as a channel of “vital importance” for reaching users.

Despite the rise of social media and digital content, traditional media are still one of the main sources of information on environmental issues (Meira, 2017). However, it is also true that given the demands of daily life today, which are defined by the usual agenda, issues related to sustainability remain highly vulnerable. According to Fernández-Castrillo & Magallón-Rosa (2023), environmental journalists play an important role in helping to raise climate awareness, and they must be able to identify the main issues and narratives related to the environment and disinformation, which implies becoming more specialised (Sendra-Duro & López-Rabadán, 2024, p.382). Moreover, in order to reach their audience, the media can incorporate new strategies, styles and narratives that improve messages in the fight against disinformation on this issue (Martín-Neira et al., 2023). Specifically, when the authors analysed online videos on climate change that were shared online, it was found that most did not have features to encourage user interaction, which would be a way to increase dissemination (De Lara et al., 2017). This shows that there is considerable room for improvement in terms of communicating environmental issues.

As pointed out by Picó (2024, pp. 86-87), the approval of the 2030 Agenda by the United Nations General Assembly in 2015 represented a “significant transformation, not only in terms of the configuration of the 17 Sustainable Development Goals, but also from a communication perspective”, providing new frameworks from which to present environmental issues.

2.2. *The lack of trust in the media*

The media sector in Spain and Portugal is characterised by its complexity, with constant technological evolution being a key factor in ensuring both relevance and effectiveness in the fields of communication and journalism (García-Avilés et al, 2023, p.6). In recent decades, the media industry has experienced a widespread decline in credibility and trust in the news. According to the Digital News Report (Newman, 2024), only four out of ten people worldwide trust the news.

However, distrust varies depending on the geographical area. In southern Europe, levels of mistrust are higher than in other European regions. Some authors (Montiel et al., 2024; Köhler & Otto, 2018) attribute this attitude to the impact of the 2008 financial crisis on countries such as Spain, Greece and Italy, which led to a more negative perception of institutions. In fact, among Ibero-American countries, only in Portugal do most people say they trust the news most of the time at the rate of 56% (Newman, 2024).

Differences in user profiles have also been observed. Although results vary according to gender, with women displaying a higher level of mistrust (Salaverría et al., 2024), the main differences are related to socioeconomic status and age. According to Rodríguez-Pérez and Canel (2023), the sociodemographic variable that yields the most accurate predictions is age: Younger citizens tend to be more resilient than their elders, but also less trusting of the news (Amoedo et al., 2023; Pew Research Centre, 2018). In Spain, only 19% of people under the age of 24 trust the news, a figure that was over 33% in 2022 (Vara-Miguel, 2024).

The factors that determine the level of credibility, which is considered the set of indicators that people use to assess trust in the media (Strömbäck et al., 2020), reflect a combination of endogenous and exogenous determinants. According to the Digital News Report Spain (Novoa-Jaso et al., 2024), the factors that users consider most important are transparency (76%) and the fair portrayal of citizens (69%). These are closely followed (62%) by respect for journalistic standards, the media outlet's track record, and the alignment of individual values with those of the media (Novoa-Jaso, 2024).

In this regard, one of the factors influencing the decline in trust in the news lies in the gradual deterioration of professional standards in some media outlets, as well as the economic weakness of the journalism industry, which makes it more vulnerable to external pressure (Salaverría et al., 2024). Along the same lines, Montiel et al. (2024) point to the widespread perception (60%) that the media industry is subject to political and commercial pressure as one of the main reasons for the decline. This view is heightened among the most polarised sectors of society, who attribute clandestine interests to content that does not coincide with their ideology.

This context of polarisation and mistrust has become a breeding ground for much of today's disinformation strategies. To the extent that traditional media lose authority, individuals tend to rely on unverified sources where information is disseminated without the screening process of journalistic rigour. This trend is especially relevant when it comes to topics of public interest, such as politics, science, and health. According to Cabrera-Álvarez and Díaz-Catalán (2022), one in four people believe they have received false science information in the past seven days. These figures increase about issues related to climate change (32.7%) and COVID-19 (37.5%). Media literacy is becoming one of the necessary strategies for curbing both information detachment and for improving the public's ability to recognise hoaxes (Sádaba-Chalezquer & Salaverría-Aliaga, 2023).

This situation not only undermines the quality of public debate, but also increases polarisation and social uncertainty, directly affecting society's ability to make informed decisions. Against this backdrop, some experts are asking whether the rise of disinformation might, paradoxically, be seen as an opportunity for the media to reaffirm their usefulness and address their lack of credibility (Salaverría et al., 2024). The answer to this question will depend mostly on the media's ability to adapt to the demands of an increasingly critical audience, provide quality information, and display a renewed commitment to transparency and accuracy.

3. Methodology

The authors used a mixed methodology for this research, integrating both quantitative and qualitative viewpoints, by combining interviews with experts and surveys of media executives in two distinct phases.

3.1. Interview phase

Based on a literature review and an effort to achieve equal representation of both genders, a list of experts was compiled in each of the following areas involved in environmental and climate change communication:

- Science and environmental communication
- Social media, platforms, and new formats
- The sector that tries to counteract disinformation

Contact with the experts was made through email. They were provided with information about the objectives of the research and the script for the interview, which was conducted online. The questions aimed to gather specific information about the field of each expert, as well as to gather both current and projected analyses. The three specific questions that formed the basis of the interviews were as follows:

1. What notable aspects of your area of expertise have a positive or negative impact on the fight against disinformation?
2. What implications might these aspects have for the media ecosystem and the quality of information in the Iberian Peninsula?
3. In your field of expertise, what future issues will be crucial in the communication and information industry?

The interviews lasted an average of 40 minutes. They were recorded and later transcribed for analysis. The consent of the interviewees was obtained in every case. The 22 participants interviewed, and their affiliations, are listed below.

- Mari Carmen Erviti: Researcher in science communication (University of Navarra).
- Ángeles Gallar: Specialist (Scientific Culture Unit, UMH).
- Laura Chaparro: Journalist (Science Media Centre).
- Luis Quevedo: Project Manager (FECYT).
- Elena Lázaro: President (Spanish Association for Scientific Communication).
- Ana Muñoz van den Eynde: Head of the Science, Technology and Society Research Unit (CIEMAT).
- Jorge Olcina: Professor of Climatology and Natural Risks; evaluator for the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) (University of Alicante).
- Asunción María Agulló: Lecturer in Agricultural Policy and Social Economy (Miguel Hernández University).
- Luis Alfonso del Portillo: Head of the Master's Degree in Energy Efficiency and Sustainability Research (University of the Basque Country).
- Clara Jiménez Cruz: CEO (*Maldita*).

- Fernando Esteves: CEO/Director (*Polígrafo*).
- Sergio Hernández: Manager (*EFE Verifica*).
- Miriam Hernanz: Director of New Narratives and Audiovisual Formats (*Prisa Media*).
- César Peña: Innovation and New Narratives Laboratory (*RTVE*).
- Pablo López Learte: Head of Product Design (*El Confidencial*).
- Pau Llop: Digital Product and Project Manager (*Prodigioso Volcán*).
- Alberto Pachano: Managing Director (We Are Social Spain).
- Marcos Gómez Piñeiro: Head of Social Media Data Analysis (*RTVE*).
- Guacimara Castrillo: Head of Social Media (*El Mundo*).
- Silvia Martínez: Director of the Master's Degree in Social Media: Management and Strategy (Universitat Oberta de Catalunya).
- Luís António Santos: Associate Director of the Centre for Communication and Society Studies (Universidade do Minho).
- Marisa Torres da Silva: Professor of Communication and Audiences (Universidade Nova de Lisboa).
- Manuel Falcão: Executive (EGEAC - Lisbon).

The fieldwork was carried out in accordance with ethical standards, and in compliance with the responsible research code of the institution that provided the framework for the research. By taking a forward-looking approach, considered especially relevant in contexts of high uncertainty such as the media, the fieldwork sought to identify the critical factors that might shape the future of the communication field in the medium and long term. The information gathered was analysed based on parameters related to the context, issues, and challenges detailed in Appendix 1.

3.2. Survey phase with media executives

A list of contacts was created using media directories, recommendations, and corporate email addresses. Invitations were sent by email between 20 June and 20 September 2023, with follow-ups sent to managers who did not initially respond. The Portuguese Press Association (*APIMPrensa*) helped disseminate the survey among its members. Thus, the sampling methodology combined direct contact with the so-called *snowball* method. Once again, ethical standards were followed in gathering and processing the information, which in this case was anonymous, as specified in the form itself.

The questionnaire was designed based on the analysis of the interviews and included questions related to the areas under study. The queries were formulated as statements about the main topics that emerged in the interviews. A 5-point Likert scale was used to gather responses to the survey statements, ranging from strongly disagree to strongly agree. In addition, the option of “Don’t know/Not answered” was added. This symmetrical structure with a neutral point in the centre was selected to enable interpretation of the results, clearly showing the respondents’ preferences, whether in favour, against, or neutral. Before sending out the questionnaire, a pre-test was carried out with four people from the media management team in order to adjust the format of the questionnaire and provide more clarity to the statements.

The feedback ensured that the questionnaire was understandable and could be completed in a reasonable amount of time. The nine statements posed were as follows.

1. In newsrooms, teams that specialise in areas such as science dissemination, health, and the environment will be established.
2. The media will adopt new formats of an informative nature to reach audiences less familiar with science issues.
3. Companies, institutions, and media outlets will provide more detailed information on progress made toward the 2030 Agenda and Sustainable Development Goals (SDGs).
4. Quality information on energy and environmental aspects will be increased with the aim of promoting social awareness.
5. Advancements in artificial intelligence will generate more sophisticated disinformation that will be increasingly difficult to verify.
6. Customised content will intensify thanks to algorithms capable of tailoring information to each user's preferences.
7. The key opportunities for tackling disinformation will lie in the development of effective media literacy programmes.
8. The presence of short, audiovisual pieces adapted to social media will increase.
9. New and minimally edited formats will emerge to present content in a more natural, transparent and accessible way.

A total of 101 responses were collected, 71 from participants in Spain and 30 from those of Portugal. The data were organised and processed using a spreadsheet designed ad hoc for the systemisation and quantitative analysis of the results. To process the information, a numerical coding corresponding to the levels of agreement expressed by the participants was applied, in compliance with the parameters of the Likert scale.

4. Results

4.1. Analysis of the semi-structured interviews with experts in the three areas

Experts of the areas analysed agree that there is a common challenge: to provide quality content for the current information domain, which is increasingly polarized, as emotionally driven content usually achieves good results in terms of engagement. According to social media expert Silvia Martínez, this is because algorithms give more exposure and prominence to this type of content, with the aim of keeping users connected to the platforms as long as possible. This polarisation, which is common in political issues, has also taken hold in the field of science communication and the environment.

In recent years, new types of denialism have emerged, especially in relation to climate change, which can lead to inaction and delays in necessary measures. In response to this problem, experts value the “voice of science” and “scientific data” as ways of preventing these trends from spreading further. However, the need for expert support in understanding scientific issues, combined with an atmosphere of widespread polarisation, fuels a sense of powerlessness and mistrust in information. This can lead to the “feeling of loss of control and anxiety”, according to Ana Muñoz, an expert in sustainability. In environmental

matters, this can contribute to the so-called “eco-anxiety” effect, which can be defined as the chronic fear that an environmental disaster will take place.

Given this context, experts highlight the need to accurately transmit scientific and environmental information to the channels through which most of the population receive their information –namely, social media. They point out the need to focus communication efforts on segments of the population who show less interest in scientific issues, or simply do not have access to such information due to their socio-economic circumstances. The experts also point out two fundamental problems: On the one hand, there is a continuous launch of new platforms, which constantly changes users’ interests and consumption patterns. This change is especially notable among younger audiences, who are accustomed to migrating between platforms (Silvia Martínez). Secondly, some sectors of society, especially young people and older audiences, have difficulty in distinguishing opinions, advertising, and information. “It’s important for users to understand that opinion, information, and a user with access to the internet are not the same thing”, according to one of the social media experts (Alberto Pachano).

In the case of scientific and environmental communication, social media is one of the unresolved issues. According to one expert in the field of science communication, Luis Quevedo, technology can create a kind of “echo chamber” where it is difficult to reach an audience that is not already interested in science. “Neither institutions nor those of us who work in this field are succeeding in gaining access to these channels”, says another expert, Laura Chaparro. The content shared on these forums rarely comes from legacy media or institutions and instead originates from private accounts without any formal training or verified sources, or from content creators.

Some of the experts consulted pointed out the need to pursue a dual strategy: firstly, to continue designing content in audiovisual formats such as podcasts and short videos, which are well received by a large sector of the population; secondly, to experiment with new formats, including those that allow for a transition from the digital to the physical world. As an example, the experts suggest creating discussion forums, talks, or streaming meetings to reach these distant sectors, according to Ángeles Gallar. They also emphasised that the messages should be developed with a clear objective: to provide verified content endorsed by rigorous sources.

In this regard, the experts point out the need to achieve a balance between the quality of information and the ability to connect with the audience. To this end, they propose developing strong rhetorical skills: “It’s not just the rigour and quality of the data that counts, but it’s also essential how well you are perceived by your audience and the emotional coherence of the stories you tell”, as affirmed by Luis Quevedo of FECYT. Along the same lines, the social media experts point to a trend that they believe will gain ground in the coming years– “real” communication. Users are starting to show a preference for calm and spontaneous content. As such, this provides an opportunity for journalists and communicators to connect with their audience through more informal and improvised communication.

The interviewees also highlighted some areas that they believe will gain prominence in the coming decade. Major issues that are interconnected such as climate change and health-related issues will remain top priorities on the science news agenda. Other experts suggest adopting the One Health approach, which is an integrated strategy aimed at optimising the health of people, animals, and ecosystems in a sustainable way (WHO). This framework could be a key feature of communicating scientific and health information in a more contextualised way (Laura Chaparro).

In the same vein, there is a clear need to place more emphasis on communication related to the 2030 Agenda and the Sustainable Development Goals. The sustainability experts assert that there is room for improvement in communication strategies related to energy resource management, both in the media and in institutions. Specifically, as highlighted by university lecturers Asunción Agulló and Luís Alfonso del Portillo, energy poverty is one of the priority issues, above and beyond the virality that this type of publication generates. Another area where communication needs to be improved is in sustainable mobility, both in local contexts and others. This is especially true of measures that are starting to be implemented in Europe, such as the creation of low-emission zones or the proposal to phase out combustion engines by 2030 (Asunción Agulló).

The interviewees are committed to creating communication initiatives and projects with a clear multidisciplinary approach, involving collaboration between agents from different fields, including government, business, research centres, society, and the media industry (Asunción Agulló). In this regard, it is necessary to design effective communication plans that take into account key moments, avoid alarmism, and provide a better context for each issue (Jorge Olcina). To do so, the media must commit to creating teams that are specialised in scientific and environmental issues, who are able to communicate a given problem using a well-defined communication strategy.

The experts also pointed out the duality involved in implementing artificial intelligence tools and big data in scientific communication. On the one hand, AI enables faster content creation, more personalised information, and the consequent optimisation of costs and resources (Pau Llop). On the other hand, the use of AI implies numerous ethical and professional challenges that will need to be addressed in the coming years. In this regard, it is essential that regulatory bodies commit to ensuring that “broadcasting platforms are jointly responsible for their content” (Luís Antonio Santos). They also emphasised the need for media literacy initiatives aimed at helping people “become aware and develop critical thinking skills that make them less vulnerable” (Sergio Hernández).

As for big data, this phenomenon is emerging as a powerful tool for extracting and analysing large volumes of information for the purpose of predicting user behaviour and improving the output of initiatives. However, the supercomputers needed to run these tools consume a large amount of energy. According to sustainability experts, the key lies in improving their energy efficiency (Luís Alfonso del Portillo) and showing society the implications of using this type of technology.

4.2. The viewpoint of media executives

After interviewing the experts and analysing the results, a series of statements related to the areas under study were designed. A five-point Likert scale was used to measure the level of agreement with each statement, which provided an approximation of the media’s perception of the issues raised by the experts. This perception encompassed the Iberian Peninsula compared to other areas, and it was also categorized by gender. The analysis of the responses is detailed below in accordance with the order established in statements A-I, with descriptive tables being provided in the most representative cases.

In the field of scientific communication on the Iberian Peninsula, only 66% of the respondents agree or strongly agree with Statement A, which says that each newsroom will establish a team specialising in areas such as dissemination, health, and/or the environment. Table 1 shows a notable disparity between Spain and Portugal. While in Spain and among Portuguese men the level of agreement is around 50%, the figure rises to 89% among Portuguese women.

Table 1. Responses to Statement A: “A team specialising in dissemination, health, and/or the environment will be established in each newsroom”

	Spain						Portugal						Iberian Peninsula	
	Men		Women		Total		Men		Women		Total			
Strongly disagree	1	2%			1	1%	1	5%			1	3%	2	2%
Disagree	2	5%	4	14%	6	8%	1	5%	1	11%	2	7%	8	8%
Neither agree nor disagree	13	31%	4	14%	17	24%	6	29%			6	20%	23	23%
Agree	21	50%	15	52%	36	51%	11	52%	8	89%	19	63%	55	54%
Strongly agree	5	12%	6	21%	11	15%	1	5%			1	3%	12	12%
Don't know/Not answered							1	5%			1	3%	1	1%
Total	42	100%	29	100%	71	100%	21	100%	9	100%	30	100%	101	100%

Source: prepared by the authors

Statement B declares that commitment to new information formats will make it possible to reach audiences who are less interested in science topics. For this statement, the Iberian average is around the passing mark of 56%, as shown in Table 2. In Spain, the percentage of managers who agree or strongly agree is slightly higher than in Portugal (62% compared to 44%). Similarly, while in Portugal the results are similar among both genders (43% men and 44% women), women in Spain display a considerably higher level of agreement than men (76% compared to 52%).

Table 2. Answers to Statement B: “The media will commit to making new, more informative formats to reach audiences who are not interested in science issues”

	Spain						Portugal						Iberian Peninsula	
	Men		Women		Total		Men		Women		Total			
Strongly disagree	2	5%			2	3%	1	5%			1	3%	3	3%
Disagree	9	22%	4	14%	13	19%	3	14%	1	11%	4	13%	17	17%
Neither agree nor disagree	9	22%	3	10%	12	17%	6	29%	3	33%	9	30%	21	21%
Agree	13	32%	14	48%	27	39%	7	33%	4	44%	11	37%	38	38%
Strongly agree	8	20%	8	28%	16	23%	2	10%			2	7%	18	18%

Don't know/Not answered							2	10%	1	11%	3	10%	3	3%
Total	41	100%	29	100%	70	100%	21	100%	9	100%	30	100%	100	100%

Source: prepared by the authors

The results of sustainability show the lowest level of agreement. Statement C asserts that companies, institutions and the media will provide more detailed information on progress toward the 2030 Agenda and the Sustainable Development Goals (SDGs). On this point, the level of agreement was limited. In Spain, the sum of “agree” and “strongly agree” responses is 44%, while in Portugal this figure rises slightly to 53%. These combined data reflect an Iberian average of 47%, indicating a general perception of insufficient communication on this priority issue.

Regarding Statement D, which says there will be an increase in quality information on energy and environmental issues to raise social awareness, Table 3 shows that the average level of agreement is 68%, with slightly higher results in Portugal (71%) than in Spain (67%). On this occasion, the highest percentage once again is for Portuguese female Directors, with 75%. Spanish women managers are once again the most skeptical, with 58% in agreement.

Table 3. Answers to Statement D: “Quality information on energy and environmental aspects will be increased with the aim of promoting social awareness”

	Spain						Portugal						Iberian Peninsula	
	Men		Women		Total		Men		Women		Total			
Strongly disagree							1	5%			1	4%	1	1%
Disagree	5	12%	4	14%	9	13%	2	10%			2	7%	11	11%
Neither agree nor disagree	6	15%	8	28%	14	20%	3	15%	1	13%	4	14%	18	18%
Agree	24	59%	12	41%	36	51%	12	60%	6	75%	18	64%	54	55%
Strongly agree	6	15%	5	17%	11	16%	2	10%			2	7%	13	13%
Don't know/Not answered									1	13%	1	4%	1	1%
Total	41	100%	29	100%	70	100%	20	100%	8	100%	28	100%	98	100%

Source: prepared by the authors

As for Statement E, which concerns the impact of artificial intelligence on disinformation, there is nearly unanimous agreement among the respondents, as shown in Table 4. Ninety-four per cent believe that the development of AI will generate more complex disinformation that will be more difficult to verify, with this perception being very strong in both Spain and Portugal.

Table 4. Answers to Statement E: “The advancement of Artificial Intelligence will promote the emergence of more complex disinformation that will be increasingly difficult to verify”

	Spain						Portugal						Iberian Peninsula	
	Men		Women		Total		Men		Women		Total			
Strongly disagree														
Disagree			3	10%	3	4%							3	3%
Neither agree nor disagree	2	5%	1	3%	3	4%							3	3%
Agree	19	45%	8	28%	27	38%	12	57%	4	44%	16	53%	43	43%
Strongly agree	21	50%	17	59%	38	54%	9	43%	5	56%	14	47%	52	51%
Don't know/Not answered														
Total	42	100%	29	100%	71	100%	21	100%	9	100%	30	100%	101	100%

Source: prepared by the authors

Statement F says that algorithms will intensify the generation of customised content tailored to customers' preferences. On this point, 60% of the senior executives surveyed agree that artificial intelligence will play a key role in tailoring the consumer's experience. In general terms, no significant differences were observed in the responses between the two countries analysed. However, it should be noted that Spanish managers showed a slightly higher level of agreement than their counterparts in the other country.

In response to Statement G, which focused on whether the main opportunities for fighting disinformation and hoaxes lie in developing media literacy programmes, 79% of respondents in Spain agreed or strongly agreed, with this figure rising to 80% in Portugal. Regarding gender, it is worth noting that among Portuguese women, the responses “agree” and “strongly agree” reach a total of 100%. In the case of Portuguese men, this percentage barely exceeds 70%. Table 5 shows a similar trend in Spain, where women are also more resolute.

Table 5. Answers to Statement G: “The main opportunities to fight against disinformation lie in the development of effective media literacy programmes”

	Spain						Portugal						Iberian Peninsula	
	Men		Women		Total		Men		Women		Total			
Strongly disagree														
Disagree	1	2%	1	3%	2	3%	2	10%			2	7%	4	4%
Neither agree nor disagree	9	21%	4	14%	13	18%	3	14%			3	10%	16	16%
Agree	22	52%	10	34%	32	45%	11	52%	8	89%	19	63%	51	50%
Strongly agree	10	24%	14	48%	24	34%	4	19%	1	11%	5	17%	29	29%
Don't know/Not answered							1	5%			1	3%	1	1%
Total	42	100%	29	100%	71	100%	21	100%	9	100%	30	100%	101	100%

Source: prepared by the authors

Overall, the executives surveyed positively rated Statement H regarding the prediction that audiovisual production tailored to social media will increase. More than 80% support the use of short, explanatory videos. However, differences emerge when the data is broken down by gender. There is greater consensus among women than among men, both in Spain and Portugal (84% versus 75% and 89% versus 81%, respectively).

As for Statement I declares that more natural, accessible and transparent editing formats will emerge, which will be adapted to social media, yet this declaration received only moderate support (69% in Spain and 60% in Portugal). It should be noted that in this case, response patterns differ significantly between the two countries, as shown in Table 6. In Spain, there is higher consensus among men (71%) than among women (66%), with a difference of 5 percentage points. In Portugal, on the other hand, women show a significantly higher level of agreement than men (89% compared to 48%).

Table 6. Answers to Statement I: “New and minimally edited formats will emerge in order to present content in a more natural, transparent and accessible way”

	Spain						Portugal						Iberian Peninsula	
	Men		Women		Total		Men		Women		Total			
Strongly disagree														
Disagree	4	10%	3	10%	7	10%	2	10%			2	7%	9	9%
Neither agree nor disagree	8	20%	7	24%	15	21%	9	43%	1	11%	10	33%	25	25%

Agree	14	34%	11	38%	25	36%	8	38%	7	78%	15	50%	40	40%
Strongly agree	15	37%	8	28%	23	33%	2	10%	1	11%	3	10%	26	26%
Don't know/Not answered														
Total	41	100%	29	100%	70	100%	21	100%	9	100%	30	100%	100	100%

Source: prepared by the authors

5. Conclusions

The analysis of the data suggests that the climate crisis will require a multidisciplinary communication approach in order to provide accurate and well-founded content, thereby avoiding alarmism. The option of designing a specific communication strategy for environmental issues is being considered. This would keep these issues on the daily agenda without overwhelming audiences, and it could offer new approaches to the problem. With this demand for specific information as part of the communication strategy, the first signs of tension between the media and the experts are becoming apparent.

We have observed that the media is not optimistic about the idea of incorporating specialised teams. In connection with this matter, it has been noted that although the experts emphasise the importance of communicating issues such as energy poverty and sustainable mobility, the managers express only scant optimism about providing more information on the 2030 Agenda and the Sustainable Development Goals. Overall, the analysis suggests that the reason for this pessimism by the media could be more related to a lack of resources than to the fact that the media consider the issue to be of minor importance.

According to the media executives from both countries, the intensifying effect of advances in artificial intelligence on disinformation is a serious threat. Most agree that the development of artificial intelligence will not only make it more difficult to verify information, but will also significantly increase the proliferation of false content. In this case, the media see a greater threat than the experts, according to the interviews with the latter. However, both sectors agree on solutions to this concern: the establishment of media literacy programmes to increase the ability of citizens to identify hoaxes and a commitment to quality information.

The experts also warn about growing polarisation in social media, which is driven by algorithms that prioritise emotional content. This phenomenon is perceived by executives as a barrier to building trust, which reinforces the need to adopt more accessible and effective communication strategies. Linked to the design of such strategies capable of reaching new generations, both experts and media leaders highlight the need to explore innovative formats. One option seems to be a commitment to short audiovisual content, as well as hybrid strategies that combine the digital and physical environments, such as debates and forums.

Media that are local, independent, or with limited resources find it more difficult to invest in these new formats and create a scientific specialisation, as both require funding and a commitment to innovation. However, the experts recommend that communication regarding environmental challenges should be more accessible, and that information should offer approaches

that connect global and local decisions. One example is explaining the need to implement low-emission zones or bringing the 2030 Agenda closer to the public. This approach would necessarily involve the work of community media. Unfortunately, however, they are currently in a weakened condition, and their precarious nature can be an obstacle to their adaptation and development (Negreira-Rey; López-García; Vázquez-Herrero, 2020).

This research has several limitations that should be considered. Firstly, as this is an exploratory study, its results are neither definitive nor conclusive. Furthermore, the research was conducted exclusively in two countries, which limits extrapolation of the findings to other geographical or cultural areas. Finally, the sample analysed is limited regarding the number of responses, which could influence the representativeness of the conclusions obtained. Despite these shortcomings, the analysis enables us to illustrate a shared opinion among the experts and executives on the importance of improving the quality of scientific and environmental communication, which requires adaptation to the new technological and social challenges.

The findings confirm that the experts have proposed specific strategies to improve environmental information, such as by diversifying formats and developing specialised units. The executives, on the other hand, reflect a more cautious approach, reflecting doubts about the capability of newsrooms to implement the necessary changes. In short, the study herein serves as a starting point for the dialogue required between the scientific community and the media. The authors suggest that future analyses must delve deeper into the causes, as well as the obstacles, that prevent the media from adopting new strategies to improve information on environmental issues and climate change.

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7. Specific contributions of each author

	Name and Surname
Conception and design of the work	Alicia de Lara González and Alba García-Ortega
Methodology	Alicia de Lara González
Data collection and analysis	Alba García-Ortega
Discussion and conclusions	Alicia de Lara González and Alba García-Ortega
Drafting, formatting, version review and approval	Alicia de Lara González and Alba García-Ortega

8. Conflict of interest

The authors declare that there is no conflict of interest contained in this article.

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Appendix 1: Classification diagram used to qualitatively analyse the interviews. Guidelines and core topic areas for interpreting the information collected

