



# 1 **Communicating the most accurate and reliable science on** 2 **climate change to society: A survey of editors from the** 3 **Intergovernmental Panel on Climate Change**

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8

9 **Abstract.** This study focuses on the perspectives of scientists involved in the IPCC AR5 and AR6 synthesis  
10 reports, examining their views on the communication of climate change knowledge and its dissemination to the  
11 public. The objectives include understanding scientists' opinions on the state of climate change knowledge, the  
12 effectiveness of current communication strategies, and recommendations for improving public engagement. A  
13 survey was conducted among 72 IPCC scientists, assessing their perceptions on various aspects of climate  
14 communication, including the use of media, educational integration, and challenges like misinformation. Results  
15 show that scientists generally rate the scientific community as well-informed, policymakers as moderately  
16 informed, and the public as only acceptably informed about climate change. Many respondents suggested  
17 improvements in the clarity and accessibility of IPCC reports, emphasizing the role of media, social networks,  
18 and education in better informing the public. The study concludes that trust in information sources is vital for  
19 effective climate communication and that a more tailored, empathetic, and solutions-based approach is  
20 necessary to bridge the gap between scientific knowledge and public understanding.

21 Keywords: communication, climate, IPCC, survey, public

22

## 23 **1 Introduction**

24

25 The challenge posed by climate change to society is immense. The overwhelming evidence that human reliance  
26 on fossil fuels has led to atmospheric warming, which in turn is altering weather patterns and the global climate,  
27 highlights the need for widespread social awareness on a global scale. Few times in human history has there  
28 been such an urgent need for a shared global consensus among all inhabitants of the planet (Somerville &  
29 Hassol, 2011). Addressing and adapting to climate change requires not only agreement on a transition to new  
30 energy paradigms but also discussions on the future of economic growth, or even potential degrowth (Hansen et  
31 al., 2008; Howes et al., 2013). This consensus must be grounded in scientific knowledge, its credibility, and the  
32 broad agreement within the scientific community (Buttel et al., 1990; Change, 2011; Fuhrer et al., n.d.).

33

34 The losses and damage already being caused by climate change, as well as those anticipated in the future,  
35 highlight the fact that there will inevitably be both winners and losers in this global crisis. This reality extends



36 the discussion beyond the realm of science, touching on ethics, politics, ecology, sociology, and even religion  
37 (Francisco, 2015). Addressing these multifaceted impacts requires an interdisciplinary approach that recognizes  
38 the complex and far-reaching consequences of climate change on all aspects of society (Molina & Abadal,  
39 2024).

40

41 In this highly complex context, science is expected to play a critical role in guiding decision-making and  
42 shaping a unified global strategy for humanity's adaptation to these changes (Cutter et al., 2012). The  
43 Intergovernmental Panel on Climate Change (IPCC) has emerged as the leading authority on expert knowledge  
44 related to climate change. However, it is not without controversy (De Pryck, 2018). The influence of its  
45 scientific reports on national and global policies often blurs the line between politics and epistemology, creating  
46 tensions around the intersection of science and policy (Beck, 2012; Hermansen et al., 2021).

47

48 From its first report in 1990 to its sixth in 2023, the IPCC's level of certainty in its findings has steadily  
49 increased. As a result, the urgency for action among decision-makers and society at large has intensified, giving  
50 rise to terms like "climate emergency" and global agreements such as the Paris Agreement. The latter aims to  
51 limit emissions and keep global temperature rise well below 2°C compared to pre-industrial levels (Höhne et al.,  
52 2021; Molina & Abadal, 2021; Ripple et al., 2022).

53

54 The scientific foundation of the IPCC reports is derived from research published in peer-reviewed scientific  
55 journals, which undergoes rigorous scrutiny by independent experts. Only knowledge that passes this  
56 demanding review process is included in these reports. However, determining which findings are ultimately  
57 incorporated into the reports that inform policymakers is itself a subject of analysis, attention, and, at times,  
58 controversy (Beck & Mahony, 2018a).

59

60 Ultimately, the knowledge and strategies for mitigation and adaptation outlined in the IPCC reports are handed  
61 over to policymakers, whose decisions impact society at large. The global strategy to combat and adapt to  
62 climate change targets individuals across all social, cultural, and religious backgrounds, as well as those from  
63 diverse economic and educational levels. The public's perception of the urgency, as well as the mitigation and  
64 adaptation strategies outlined in the IPCC reports, extends beyond policymakers (Gemeda et al., 2023). These  
65 reports form a key part of the information that reaches global society, which must ultimately support the  
66 decisions made by political leaders. The popularization of the IPCC's findings—making complex scientific and  
67 technical information accessible to the general public—requires an effective communication strategy. This  
68 strategy should ensure that people of all knowledge levels can understand and engage with the content (Doran et  
69 al., 2023; Rödder & Pavenstädt, 2023).

70

71 **2 Objectives**

72



73 Our study group consists of scientists who were part of the writing teams for the IPCC5 and IPCC6 synthesis  
74 reports. We are interested in their perspectives on the communication aspects of current climate change  
75 knowledge, as well as their views on how effectively this information is being conveyed to the public.

76 The specific objectives are as follows:

- 77 1. To understand the perspectives of IPCC scientists on the current state of climate change and their role  
78 in efforts to reduce and mitigate its impacts.
- 79 2. To gather opinions from IPCC scientists on how best to communicate the scientific content of IPCC  
80 reports to the public.
- 81 3. To collect proposals from IPCC scientists on how to improve the dissemination of this scientific  
82 information to society at large.

83 The scientific knowledge about climate change that reaches society must be both up-to-date and supported by  
84 the broadest possible consensus within the scientific community. Additionally, this knowledge should be  
85 presented in a way that is not only rational and easy to understand but also resonates with people on emotional  
86 and spiritual levels across different cultures (Bolisani & Bratianu, 2018).

### 87 3 Methodology

88

89 The IPCC reports are published approximately every seven years, which can make it challenging to stay in  
90 contact with the scientists who contributed to them. For this reason, we have focused our study on the two most  
91 recent reports: IPCC AR6 and IPCC AR5. Our sample includes members of the Scientific Steering Committee  
92 for the IPCC AR6 synthesis report (IPCC, n.d.), as well as the Chairs and Vice-Chairs of the IPCC AR5  
93 synthesis report.

94

95 The fifth IPCC report was published in 2014, nine years before we launched our survey. As a result, some of the  
96 scientists involved were no longer reachable at their original contact addresses. To address this, we searched  
97 research publication databases for up-to-date contact information for both the IPCC AR5 and AR6 synthesis  
98 report writing teams. After accounting for deceased individuals, we obtained a final sample of 28 contacts from  
99 the IPCC AR6 and 44 from the IPCC AR5, resulting in a total of 72 contacts across the two reports.

100 The survey was structured into four sections: general information about the scientists, their perception of the  
101 current level of knowledge on climate change, their views on the IPCC reports, and opinions on the  
102 communication of these reports to society. We used closed-ended questions with a Likert scale, along with  
103 open-ended options for questions related to communication.

104 The survey questions were reviewed by a scientist who contributed to both the IPCC AR6 and AR5 reports. To  
105 rate the responses on the Likert scale, we assigned numerical values to each option, with 1 representing the  
106 lowest value and 5 representing the highest. We then averaged the responses for each question or survey section.



107 The resulting average reflects the respondents' positions based on the following scale: 1 = very low, 2 = low, 3 =  
108 neither high nor low, 4 = high, 5 = very high.

109 To enhance the clarity of the results, we multiplied the average by two, converting the values to a scale of 1 to  
110 10. The results were then classified using standard educational labels: "Very poor / F" from 0 to 2.9

111 "Insufficient / E from 3 to 4,9

112 "Sufficient / D" from 5 to 5,9

113 "Good / C" from 6 to 6,9

114 "Notable / B" from 7 to 8,9

115 "Excellent / A" from 9 to 10

116

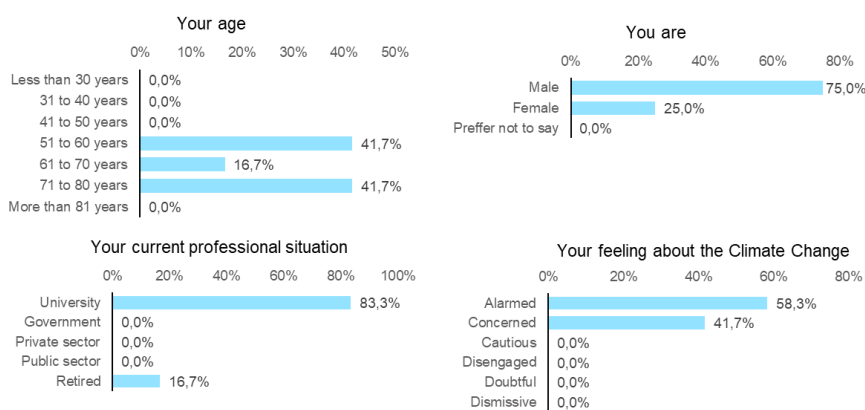
117 The survey was distributed via email using a Google Forms format, with English as the language of  
118 communication. It was initially sent out in February 2023, coinciding with the approval phase of the IPCC's  
119 Sixth Assessment Report, which took place at the 58th panel session in Interlaken, Switzerland, in March of the  
120 same year. A reminder was sent in April, after the approval process had been completed.

121

## 122 4 Results and discussion

123

124 The scientists who responded to the survey (figure 1) were aged 51 and older, with a significant portion (58.4%)  
125 over 61. Although only one respondent explicitly identified as retired, the CVs of those who provided their  
126 details indicate that some hold emeritus professor positions at their respective universities. The majority of  
127 respondents were men (75%) and from academic institutions (83,3%). The representation of women, at 25% of  
128 responses, aligns with the published gender demographics of IPCC report authors (Liverman et al., 2022). The  
129 age distribution of our respondents is also consistent with findings from other studies on IPCC authors (Gay-  
130 Antaki, 2021).



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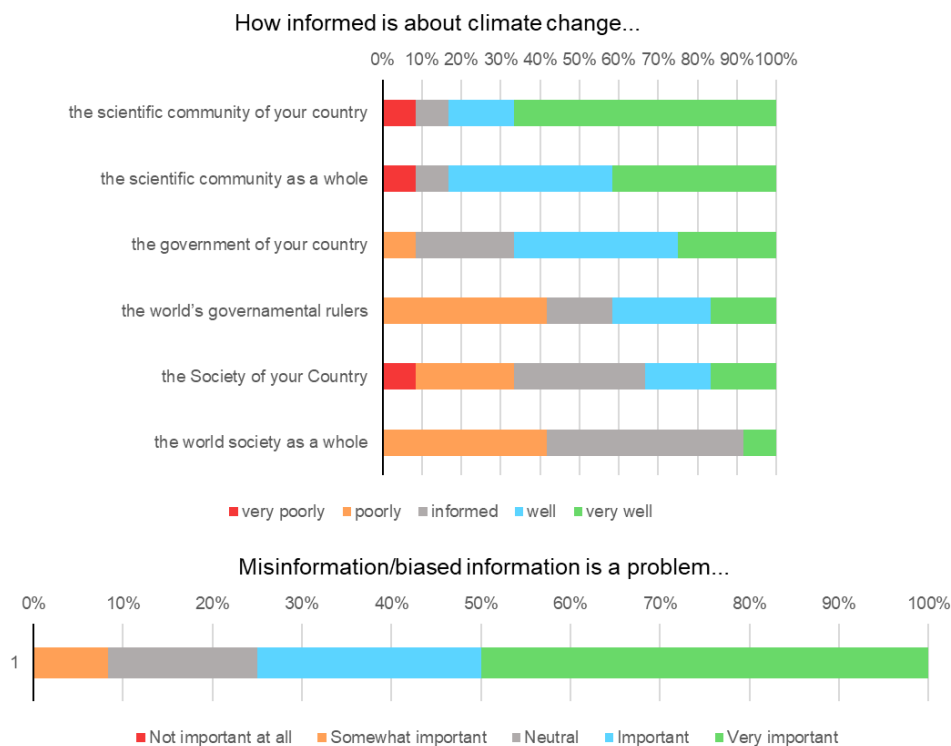
132 *Figure 1. Age, Gender, Profession & Feelings about Climate Change*



133

134 The majority of participants feel alarmed (58,3%) or worried (41,7%) about climate change. Those with a  
135 deeper understanding of the current climate situation tend to view its potential future with greater concern and  
136 alarm. This aligns with the evolution of the "Global Warming's Six Americas" framework, which illustrates a  
137 growing concern about climate change and a shift in public attitudes over time (Leiserowitz et al., 2021).

138 Responses indicate that participants (figure 2) view the scientific community as highly informed about climate  
139 change (rated 8,7) while they consider policymakers only moderately informed (rated between 6,3 (world) and  
140 7,7 (local)). In contrast, the general public is seen as being only "acceptably" informed (rated between 6,2  
141 (local) and 5,5 (world)). Participants also identified misinformation and biased, self-interested information as  
142 notable issues (rated 8,3) The literature on climate change communication highlights several key points:  
143 explaining its causes enhances science acceptance, emphasizing scientific consensus counters misinformation,  
144 culturally aligned messaging is more effective, and inoculating against misinformation works best, though  
145 debunking can also be successful.



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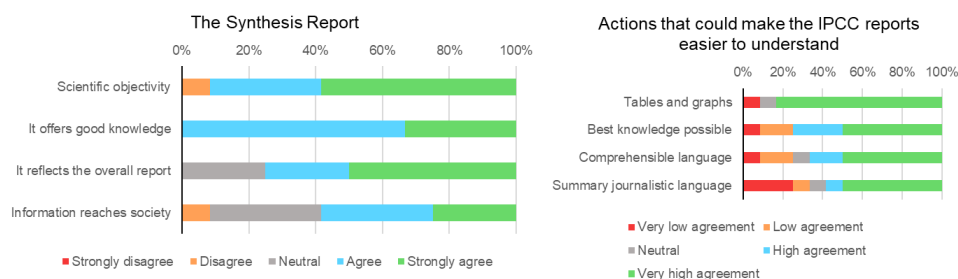
147 Figure 2. Information Status, and Biased information

148



149 Regarding the IPCC reports (figure 3), the majority of participants believe they demonstrate notable scientific  
150 objectivity (rated 8,8) and reflect the best available knowledge on climate change (rated 7,8). While respondents  
151 feel that the reports have a notable impact on society as a whole (rated 7,5), opinions vary more widely in this  
152 area.

153 The use of graphs and tables to enhance comprehension is highly appreciated (rated 9), as these visual aids make  
154 the reports more understandable (Harold et al., 2020). Many respondents see the primary role of the IPCC  
155 reports as providing the best possible information to decision-makers, rather than directly to the general public.  
156 They believe that the public often accesses these reports through other interpretive channels, as expressed in  
157 open-ended responses.



158

159 *Figure 3. About Summary Reports & Understanding of Reports*

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161 Many respondents suggested the possibility of creating a more concise version of the IPCC summary report  
162 specifically for the general public. Our survey findings align with the discussions and recommendations from  
163 the IPCC's February 2016 Expert Meeting on Communications and their ongoing implementation. The goal is  
164 to deepen understanding of the IPCC's communication efforts within the broader context of climate  
165 communication and policy. This may also inspire further ideas on how to strengthen the IPCC's communication  
166 strategies (Lynn, 2018).

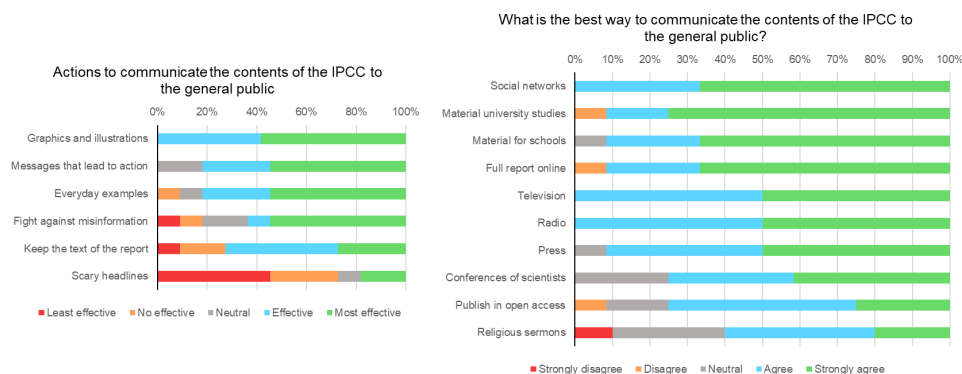
167 When discussing how to communicate the contents of IPCC reports to the public, the majority (rated 9,2)  
168 believe it is appropriate for these reports to be integrated into university curricula and school education (rated  
169 9,2). The strong agreement among our survey respondents aligns with literature indicating that university  
170 students believe climate change is real and primarily human-induced, with the majority expressing concern.  
171 However, the studies also reveal misconceptions about the fundamental causes and consequences of climate  
172 change (Wachholz et al., 2014).

173 Respondents also emphasized the importance of making the reports fully accessible to everyone via the internet  
174 (rated 9). Social networks (rated 9,3), along with media outlets like television (rated 9) and radio (rated 9), were  
175 seen as the most suitable platforms for informing the public. The written press was rated slightly lower (rated  
176 8,8), but still viewed as an important channel. Overall, respondents rated highly the effectiveness of these



177 channels for informing the population. The use of new media aligns with studies suggesting that non-elite  
178 actors, such as individual bloggers and concerned citizens, are effective climate change advocates. While  
179 mainstream media remains the most frequently discussed, new media and science information sources are strong  
180 competitors for audience attention (Newman, 2017).

181 It is worth noting that some respondents expressed dissenting opinions on the use of journalistic language,  
182 political debates, and religious or spiritual sermons in the communication of these reports. The simplification of  
183 scientific information often risks undermining its credibility, largely due to a failure to recognize the tensions  
184 between scientific and public interpretations. Maintaining scientific credibility requires balancing it with  
185 meaningful social and political dialogue about the values we hold and the actions we take to protect them.  
186 Strengthening the link between the theory and practice of climate science communication is essential (Hollin &  
187 Pearce, 2015; Pidcock et al., 2021).



188

189 *Figure 4. Public Communication and Channels*

190

191 Misinformation is widely seen as a significant problem (rated 7,8). This issue was raised three times throughout  
192 the survey (Sanford et al., 2021), and in both instances where respondents were asked whether misinformation  
193 was a concern, the responses were remarkably consistent. There was even stronger agreement on the need to  
194 actively combat misinformation (Lewandowsky, 2021).

195 According to respondents, the biggest challenge in communicating climate change is not the difficulty of  
196 understanding its scientific aspects (rated 6,5), nor simply the need to convey clear and relevant information to  
197 users (Adler & Hirsch Hadorn, 2014). Instead, the primary challenge lies in the complexity of decision-making  
198 within social and economic contexts (rated 8,3). As highlighted in the literature, this complexity reflects an  
199 evolving relationship between climate science and policy, which is undergoing a significant transformation  
200 (Beck & Mahony, 2018b).

201 Additionally, the vast majority of participants provided comments and suggestions in the open-ended questions.  
202 Among the most commonly suggested solutions were:



- 203 • Short, simple, and easy-to-understand messages, that may help in making IPCC a power  
204 communicating tool (Stocker & Plattner, 2016).
- 205 • Demonstrating empathy towards individuals and communities by linking climate change to everyday  
206 life and focusing on the future of new generations, while staying true to the content of the reports  
207 (McBeth et al., 2022).

208 One notable response from Ethiopia highlighted the need to improve the training of those responsible for  
209 informing the public about climate change.

210

## 211 Conclusions

212

213 Participation in our survey was relatively low, with only 16.6% of the sample responding. The lack of  
214 engagement from key IPCC scientists, who are responsible for preparing the institution's most widely read  
215 reports, aligns with findings from previous studies highlighting the difficulty that the average reader has in  
216 comprehending these reports (Dormer, 2020; Jos Delbeke et al., 2019).

217 One lead author of IPCC AR6 WGII declined to participate in the survey because it did not allow the option to  
218 leave questions blank or to skip options, they felt were insufficiently detailed. Another scientist, a vice-chair of  
219 the IPCC AR6, completed the survey but expressed, both in the open-response section and via email, their  
220 disagreement with several concepts and requested that some of his responses be disregarded.

221 The disparity in participant behavior in our survey is evident: while some respondents scored highly on  
222 questions involving concepts such as journalistic language, religion, or politics, others either refused to  
223 participate or expressed dissatisfaction with the inclusion of these topics. This highlights the need for a revised  
224 communication strategy that addresses these concerns and enhances the impact of the IPCC report content  
225 (Anseel et al., 2010; Bhandari, 2022; Solecki et al., 2024).

226 Trust in the source of information is crucial for that information to influence decision-making. This relationship  
227 between trust and decision-making has been extensively studied in medicine, particularly in managing the  
228 delivery of "bad news" and the need for patients to make significant decisions. Informed decision-making is  
229 now a well-established practice in medical fields (Chandra et al., 2018; Musmade et al., 2013).

230 Information about climate change often represents "bad news" for much of society, requiring careful  
231 communication and informed decision-making. Trust in the source of climate information is just as essential as  
232 it is in medicine. Similar to medical contexts, recipients of climate information often lack the full capacity to  
233 understand highly technical or scientific content, especially during times of emotional stress. Therefore, this  
234 information needs to be adapted to the audience's level of understanding. The scientists' responses in our survey,  
235 which emphasize the need for empathy and a solutions-based approach, reflect this mindset. While the diagnosis  
236 and proposed solutions must come from science, their implementation requires clear communication to society,





237 which must ultimately make the final decision—ideally, with widespread social consensus (Goldberg et al.,  
238 2020).

239 The open-ended responses to our survey also highlight the critical role of trust in the information source  
240 (Goodwin & Dahlstrom, 2014). National Meteorological Services serve as key guarantors of the accuracy and  
241 reliability of past climate data, which underpins their credibility when comparing past and present data to  
242 confirm that climate change is occurring. They also play a vital role in explaining the new climate realities to  
243 society, allowing people to comprehend and contextualize the future climatology they will face (Molina &  
244 Abadal, 2024).

245 Communication is a broad concept that encompasses the sender, the receiver, and the message. However, it also  
246 involves the action (or inaction) of communicating, beyond the mere intentions of those sending and receiving  
247 information (Charles Bazerman, 2019; Luhmann, 1992). In the case of climate change, where the active  
248 participation of the public is crucial, a proliferation of diverse and engaging narratives around the topic is  
249 necessary to inspire action and understanding.

250 These narratives must be tailored to the diverse cultures, beliefs, and values of different human communities  
251 worldwide, offering a moral framework that is acceptable to all (Hulme, 2009). Climate change communication  
252 involves many stakeholders with varying levels of expertise and perspectives, yet all rely on the scientific  
253 foundation of climate knowledge. How this knowledge reaches and resonates with society is crucial, and the  
254 process of popularizing it should involve the scientists who created it. Developing a methodology within the  
255 IPCC itself to produce texts written in clear, accessible language—akin to journalistic style (Smith & Higgins,  
256 2020)—could help reduce the contradictory and confusing headlines that often reach the public. Some IPCC  
257 scientists who responded to our survey suggested that this could be an innovation for future cycles, proposing  
258 ideas such as creating a summary text for the general public, approved by scientists rather than governments, to  
259 eliminate concerns about politicization and preserve trust in both the message and its source.

260 The role of the media and social networks in interpreting and delivering IPCC information to the public is vital,  
261 as reflected in the opinions of our respondents. Media coverage and social media discussions shape public  
262 opinion on climate change (Pearce et al., 2019; Sarathchandra & Haltinner, 2023). The media's portrayal of the  
263 Conferences of the Parties (COP), where decision-makers, government representatives, and non-governmental  
264 organizations gather, also influences societal perceptions of climate action and the acceptance of measures to  
265 mitigate climate change, whether current or forthcoming (Sisco et al., 2021).

266 In recent years, significant research has explored the role of emotions, empathy, and affect (Brosch, 2021) in  
267 climate change communication, aiming to inspire societal action. However, the gap between climate scientists  
268 and the delivery of their findings to the global public remains unresolved. More efforts are needed to create  
269 content that can be directly communicated to society without the often inaccurate interpretations introduced by  
270 intermediaries who currently serve as the public's source of climate information.

271



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273

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