

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

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MS No.: gc-2024-8

MS type: Research article

1. General comments

Thank you very much for the interesting and valuable proposition to survey the IPCC scientists on communicating climate science.

I have taken into consideration the annexed “Questionnaire” (survey questions) that the authors kindly provided in answer to Referee #1 (RC1).

I am concerned, however, that the survey questions are vague and there is not enough information on the respondents and their communication expertise to understand if they answered the survey (assessing, for example, effectiveness of communication methods) based on their past experiences or if their answers were speculative opinions based on their intuition. While the latter one is interesting to read and answers to one of the study’s objectives, “understanding scientists’ opinions”, only the former one could empirically serve the study’s aim to form “recommendations for improving public engagement”.

This aligns to lines 235-236 (“While the diagnosis and proposed solutions must come from science, their implementation requires clear communication to society”): the science expertise is one phase, the effective communication is another. It is not clear if the results presented here could be applied to form a clear communication strategy.

I would kindly suggest to the authors to include a richer and more up-to-date source of references to back up several statements throughout the manuscript. I have made specific suggestions below.

I would also kindly suggest to the authors to address the limitations of the survey more clearly in the Discussion section, including the rather homogenous pool of respondents (male, senior, university, as well as 0% work in government, public or private sector).

I would recommend for future iterations, to offer a more detailed profile of the surveyed scientists: the degree to which they have previously been involved in communicating (climate) science to non-scientific audiences, as well as which research fields they belong to, for example. Currently knowing that 83% work in university gives us only a homogenous profile. Yet reports on the use of social media indicate that their use is very demographic dependent. Knowing more about the experience of the respondents with communication tools or their profile may be relevant to the survey questions asking for their opinion regarding the best actions/platforms to communicate climate science (Figs 3-4).

2. Specific comments

The introduction would benefit from additional up-to-date references.

Line 14:

“Results show that scientists generally rate the scientific community as well-informed, policymakers as moderately informed, and the public as only acceptably informed about climate change.”

1. Which criteria did scientists base the degree of “informed-ness”, and how did they assess these criteria across stakeholders: eg, policymakers versus public?

Line 25

“The challenge posed by climate change to society is immense.”

2. The references in this paragraph are rather old, from 1990-2013. I would recommend complementing them with newer citations.

Line 25

“The overwhelming evidence that human reliance on fossil fuels has led to atmospheric warming, which in turn is altering weather patterns and the global climate, highlights the need for widespread social awareness on a global scale.”

3. Please include references to some of that evidence, perhaps literature reviews. I suggest it may be beneficial to include among the earliest references that find evidence of the warming effect of fossil fuels to emphasise the need for awareness you mention.

Line 28:

“Few times in human history has there been such an urgent need for a shared global consensus among all inhabitants of the planet (Somerville & Hassol, 2011).”

4. Your single reference is from 2011. I would suggest adding a reference to an example from covid that induced an urgent, global evidence-based response and was dependant on communication to the general public.

Line 29:

“Addressing and adapting to climate change requires not only agreement on a transition to new energy paradigms but also discussions on the future of economic growth, or even potential degrowth (Hansen et al., 2008; Howes et al., 2013).”

5. Again, I think this statement would also benefit from including up-to-date references. Perhaps it may also be relevant to add a reference to the IPCC adaptation and mitigation report.

Lines 34-35:

“The losses and damage already being caused by climate change, as well as those anticipated in the future, highlight the fact that there will inevitably be both winners and losers in this global crisis”

6. References are missing for this statement.

Line 41:

“In this highly complex context, science is expected to play a critical role in guiding decision-making and shaping a unified global strategy for humanity's adaptation to these changes (Cutter et al., 2012)”

7. I would recommend including a reference to research that highlights the importance of using scientific evidence to guide decision-making in the context of climate action.

Line 60:

“Ultimately, the knowledge and strategies for mitigation and adaptation outlined in the IPCC reports are handed over to policymakers, whose decisions impact society at large”

8. It would be interesting to include references to a study of the impact of IPCC reports on policymaking, such as the Paris Agreement.

Line 65:

“reports form a key part of the information that reaches global society, which must ultimately support the decisions made by political leaders.”

9. The order of the words implies the reports should support the decisions of political leaders; do you rather mean, the political leaders should uptake these reports in their decision making?

Line 67:

This strategy should ensure that people of all knowledge levels can understand and engage with the content (Doran et al., 2023; Rödder & Pavenstädt, 2023).”

10. To conclude the introduction section, I would suggest adding a sentence stating the aim of this paper, i.e. how this study aims to contribute to such a communication strategy.

Line 84:

“Additionally, this knowledge should be presented in a way that is not only rational and easy to understand but also resonates with people on emotional and spiritual levels across different cultures (Bolisani & Bratianu, 2018).”

11. I would recommend adding more studies on the effect of empathy, psychology (behavioural science), and overall emotional connection for effective climate communication. Perhaps include how on the other hand, there is a negative effect to contend with, such as climate anxiety.

Methodology

The methodology could include more details on the design of the questions, the review process of the questions, and how the open-ended questions were analysed. Below please find specific comments:

Line 100:

“The survey was structured into four sections: general information about the scientists, their perception of the current level of knowledge on climate change, their views on the IPCC reports, and opinions on the communication of these reports to society.”

12. How were the survey questions designed and by whom? Was a survey expert consulted?

Line 103:

“open-ended options for questions related to communication”

13. How were open ended answered analysed? There is little mention of the outcome of this section in the Discussion. Could the answers be anonymized and shared in the annex?

Line 104:

“The survey questions were reviewed by a scientist who contributed to both the IPCC AR6 and AR5 reports. “

14. Was there a testing phase to assess clarity/ambiguity of the questions before the final survey was sent out?
15. How was this one scientist chosen to be the reviewer and what they reviewed (clarity of questions? Appropriateness of language?), or if they had expertise in survey assessment/design.

Results and discussion

Line 154-155:

“Many respondents see the primary role of the IPCC reports as providing the best possible information to decision-makers, rather than directly to the general public.”

16. Is the statement coming from the open-ended questions?

Line 170:

“students believe climate change is real and primarily human-induced..”

17. I would suggest to exchange the word ‘believe’ to ‘understand’ or similar. In my opinion, it doesn’t serve the scientific community to use the word ‘believe’ in the climate discussion.

Lines 173-182:

18. This paragraph describes the results of the survey where social media is rated as a most efficient platform to communicate, with religious sermons in the other extreme. I would respectfully argue that not knowing what the respondents base this assessment on (personal experience with social media? past collaboration with or presentations during a religious sermon?), it is hard to read an opinion on how 'effective' a platform is.

Lines 183-185:

19. These statements could be supported by references to studies on the effect of scientific language, values, etc on scientific credibility.

Lines 202-207:

20. You are listing examples of the most common open-ended questions. It is not then clear why there are references to the two listed proposals. Did participants all coincide with these references? Or are you adding supporting references to their opinions?

Line 208:

21. You make no prior reference to the geographical representation of the respondents. Including 'Ethiopia' here seems needless, unless their suggestion is particularly relevant coming from that country. I suggest rephrasing it to 'one notable response included...".

Conclusion

Line 214-2016:

22. It is not clear to me the relation between high-profile IPCC authors responding the survey and the ability of the average reader to understand the report. Please clarify, if you agree.

Line 223-224:

"...expressed dissatisfaction with the inclusion of these topics. This highlights the need for a revised communication strategy that addresses these concerns and enhances the impact of the IPCC report content"

23. It is not clear from this sentence if respondents expressed dissatisfaction with having to answer questions on these topics in this survey, or in the inclusion of these topics in the discussion of climate communication in general. Your call to action to address these concerns would suggest the latter, but it is not clear to me from this sentence which it is. You had mentioned in line 217-218 that one of the respondents, lead author of the IPCC, declined to participate in the survey due to the questions of the survey.

Line 255:

24. You suggest using "clear, accessible language—akin to journalistic style" for the general public; however over 30% of your respondents (figure 3) seem to have

“low-” or “very low agreement” that such an action would make the report easier to understand. Could you please add a comment on this to the discussion?

Line 267-268:

25. When discussing a gap in effective communication between scientists and the public, I would suggest bringing to the discussion the concepts of knowledge brokers or boundary organisations, which is not discussed at all in this study. For example, a call for knowledge brokers and boundary organisations – albeit in the context of evidence-informed policy making- is the European Commission’s JRC “[Commission staff Working Document](#)” (SWD(2022) 346).

3. Technical corrections

26. Some decimal points are marked by periods (full stops) and some by commas. Please make it consistent. eg. Line 123-126: “The scientists who responded to the survey (figure 1) were aged 51 and older, with a significant portion (**58.4%**) over 61 [...] The majority of respondents were men (75%) and from academic institutions (**83,3%**)”

Line 132 -

27. Figures captions don’t need to capitalise each word, eg in: “Age, Gender, Profession & Feelings about Climate Change”

Line 134-135:

“Those with a deeper understanding of the current climate situation tend to view its potential future with greater concern and alarm.”

28. I understand you are referring to the surveyed IPCC scientists versus the general public in this line. It may be helpful to clarify you are comparing the respondents to the general public to avoid confusion since the previous line is comparing the different levels of worry of only the surveyed scientists.

Line 159- Figure 3 caption

29. You use the word “Summary” report, and in the figure it is ‘Synthesis report’. Please make consistent.

30. The phrase ‘summary journalistic language’ is not proper English. Please amend.

Line 189:

31. Figure 4: The figure legend has a typo: “No effective” (green). Change to ‘Not effective’.

Line 216:

32. Order of reference out of chronological order.

Supplement

The supplement pdf seems to be have truncated questions. Kindly verify the file is correct.