

# Visuals in Climate Communication: A systematic literature review.

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## Summary

Images are powerful. They can make you feel things, help you understand, and motivate you to take action. Studies have shown that people can be influenced by visuals when it comes to climate change. For example, when you see a visual representation of rising sea levels or an infographic that shows how deforestation causes carbon emissions, it can have a stronger and more lasting impact on you.

We carefully researched visuals in climate communication by checking academic papers and peer-reviewed articles. We wanted to understand what makes climate communication unique and how visuals help in this process, so we chose papers with pictures inside the article itself for our study.

These studies found that using visual aids in climate communication is not just about educating people; it can also have an impact on policymakers and other important stakeholders. Good visuals can help them understand complex data and scientific research, making it easier for them to take action. Plus, these visuals can simplify complicated information, making it more convincing and easier for decision-makers to get behind.

Also, when we discuss how pictures and videos help communicate the message about climate change, it is important to remember how much digital media and social media platforms matter. Sharing visual content on social media can spread quickly and reach all kinds of people, making the message louder and raising awareness among many more people.

Using visuals in climate communication can really make a difference in how people see things, especially when it comes to shaping public opinion, influencing policy decisions, and mobilizing people to take action. This review will help you understand how visuals can drive change towards a more sustainable future. It shows how visual aids can be a powerful tool to help people better understand climate change and motivate them to do something about it.

## Abstract

In recent years, there has been interest in the field of climate communication, with experts exploring different paths to communicate about climate change effectively. One area that has received particular attention is the role of visuals in this process. In this review, we delve into the use of various types of visuals, including graphs, comics, 3D imagery, and photographs, to communicate climate-related information. By analyzing and synthesizing the literature on the findings of multiple studies in this area, we seek to provide a comprehensive summary of the current understanding regarding the use of visuals for climate communication. To ensure the quality of our review, we utilized a rigorous search process, using the tools Google Scholar, JSTOR, and Scopus, and filtered the articles to include only those that contained images within the article itself.

The results revealed a wide range of outcomes and complexities, indicating both potential advantages and difficulties associated with integrating visuals into efforts related to climate communication. It was determined that visuals are vital in enhancing audience comprehension and engagement and influencing behavioral changes within climate communication.

## **1. Introduction**

In the climate communication field, visuals have become crucial for effectively conveying information and engaging audiences. These visuals capture attention, facilitate understanding, and evoke emotional responses (Hurlstone et al., 2014). They can simplify complex data and concepts, making them more accessible to a wide range of audiences by enhancing comprehension and retention of information (Leiner et al., 2013).

This seems to contrast with climate change communication research, where O'Neill (2019) expresses that one common concern in climate change communication research is the focus on text alone, neglecting the potential impact of visual imagery in improving engagement and understanding. Therefore, the challenge is to evaluate the different types of visuals used in climate communication, their effectiveness, and their influence on audience perception and behavior.

Nevertheless, successful examples of visuals in climate communication can be found, like images showing climate change's impacts on vulnerable communities, such as photos of melting glaciers or flooded cities (Martel-Morin & Lachapelle, 2022). These visuals humanize the issue of climate change and make it more relatable to individuals; they can elicit emotional responses and create a sense of urgency, motivating individuals to take action in combating climate change and adopting sustainable practices (Lehman et al., 2019).

Another good example is animal images that depict climate change's effects, such as polar bears stranded on melting icebergs or coral reefs bleached from rising ocean temperatures (Liu, 2018). These visuals evoke empathy and concern for the natural world and highlight the urgency of addressing climate change to protect these vulnerable species and ecosystems (Hopke & Hestres, 2018).

Although there are example studies investigating the effects of visuals in climate communication (O'Neill, 2019; Lehman et al., 2019). These studies typically do not focus on the characteristics of these visuals to explain the effects of the communication but rather on the overall effect in general.

Therefore, this literature review aims to fill this gap by examining the role of visuals in climate communication and exploring their potential to convey information effectively, evoke emotions, and motivate individuals to take pro-environmental action.

## **1.1. Framing**

Framing is a crucial aspect of climate communication that influences how audiences present and interpret information. In textual communication, framing refers to how audiences present and interpret information to shape their perception and understanding of an issue (Boer, 2007).

In addition, textual framing can shape the narrative around climate solutions and policy actions. For instance, textual framing can play a crucial role in advocating for policy changes and promoting sustainable behaviors by emphasizing the urgency and benefits of taking action (Rademaekers & Johnson-Sheehan, 2014)

Visuals play a similar role in framing climate change communication. Visuals can frame climate change by emphasizing certain aspects of the issue, such as its impacts on vulnerable communities or the importance of adopting sustainable practices (O'Neill & Smith, 2013).

The concepts of framing and visual framing play an important part in shaping our understanding of the world around us. It involves how information is presented, emphasizing certain aspects while downplaying others to influence the perceptions and interpretations of the audience (Bock, 2020).

By researching these concepts, we can better understand how visual elements and framing techniques shape our cognitive processes and ultimately contribute to constructing meaning within different contexts (Geise, 2017).

Framing tactics involve carefully selecting and presenting information to frame a particular narrative or perspective. They include emphasizing certain aspects, including or excluding specific details, using persuasive language, and determining the overall tone and context in which information is presented (Frosh, 2011).

Visual elements are fundamental in framing as they capture the audience's attention and compellingly convey information. Images, colors, layout, and design all contribute to creating visual frames that guide the audience's perceptions and understanding (Bock, 2020). For example, in media coverage, the selection of photographs or videos can strongly influence how events are interpreted and remembered. Visual framing in advertising similarly impacts consumer attitudes and behaviors, as certain images and designs can evoke specific emotions and associations. Moreover, using visual elements in social discourse, such as infographics or

memes, can shape public opinion and influence discussions on important issues (Aalberg et al., 2011).

In this context, using images can enhance the persuasive power of framing tactics by appealing to the audience's emotions, values, and personal experiences. Additionally, visuals can simplify complex information, making it more accessible and relatable to the audience (Fahmy et al., 2015). Overall, the study of visual framing provides valuable insights into the role of visuals in communication and how they contribute to the construction of meaning and influence our cognitive processes.

## **1.2 Thematic significance and geographical setting**

The thematic significance of images in climate communication lies in their ability to convey complex scientific information and evoke emotional responses (Beek et al., 2020). This can be particularly important in engaging and mobilizing audiences towards climate action. However, the literature suggests that not all images are equally effective in achieving these goals (O'Neill, 2013).

Some visuals, such as images that depict the consequences of climate change or the potential future impacts, are more likely to convey the urgency and importance of the issue. On the other hand, images that emphasize losses and negative impacts may be more engaging to audiences but may also reduce motivation to take action (Corner et al., 2010).

The Geographic settings of images also play a role in climate communication. For example, images that showcase the effects of climate change in specific geographic locations, such as melting glaciers or coastal erosion, can make the issue more tangible and relatable to audiences who may not have personal experiences with climate change in their area (Scavia et al., 2002).

## **2. Methodology: Visuals in climate communication**

A systematic literature search was performed to conduct a comprehensive literature review on visuals in climate communication. This research aims to understand the characteristics of climate communication by examining peer-reviewed articles and academic papers.

The search was performed on 18 September 2023 and 19 September 2023. We used the five-stage approach suggested by Wolfswinkel et al. (2013) for this review: 1) criteria selection, 2) literature review, 3) selection and refinement, 4) analysis, and 5) presentation.

All the found literature was later imported to the reference management software Research Rabbit for organization and analysis; this tool also helped to make a further and refined search on visuals in climate communication since it is a "citation-based literature mapping tool" that aims to streamline your search for references when you begin planning an essay, minor project,

or literature review. Its primary purpose is to save time by using one or multiple seed papers as the starting point and identifying additional relevant papers based on the selected seeds. This tool eliminates the need to switch between different search modes and databases, providing seamless research support. The years for this search were between 2010 and 2023.

## 2.1. Criteria selection

To ensure the selection of relevant and high-quality sources, the inclusion criteria for the literature review included publications that: 1. focused explicitly on visuals in climate communication; 2. included the actual visuals analyzed and used in climate communication strategies; 3. examined the impact of visuals on audience understanding and perception of accompanying articles; 4. They must be published in peer-reviewed journals.

## 2.2. Literature search

As a first step to finding the most important keywords, a general search was performed using Google Scholar. That way, we could get a general scope of the available literature; the initial terms used were "climate change" and "visual communication." From there, a subset of keywords were found, for example, "Science communication," "Environmental communication," etc., as shown in Table 1. Additionally, the first papers we found that included images were the source of keywords such as "visuals" and "imagery."

**Table 1**

*Search terms used on the search string.*

Search term	Used Keywords
<b>Climate change communication</b>	"Environmental communication" OR "Climate change communication" OR "Climate crisis" OR "Eco-communication" OR ("Conservation" AND "Sustainability" AND "Nature")
<b>Visual Communication</b>	("Imagery" OR "Visuals") AND "Science Communication" OR "Social media communication"
<b>Engagement</b>	"Public engagement" OR "Public participation" OR ("Perceptions" AND "Civil action") OR ("Involvement audience" AND "Citizen")

After using Google Scholar for the general view, further search included the academic databases JSTOR and Scopus; this search generated a total of 40 peer-reviewed records.

### 2.3. Selection and refinement

After compiling a comprehensive list of relevant literature, the next step was carefully selecting and refining the sources that best addressed the research objectives. Only sources that provided a detailed analysis of visuals in climate communication were included in the final review. After taking out the duplicates found, we were left with 37 articles. The titles and abstracts of the selected articles were reviewed to determine their relevance to the research topic by excluding those that did not include the keywords previously mentioned. For example, some discussed risk prevention during natural disasters and hurricanes. Finally, we were left with eight full texts that included the actual visuals in their publications. The complete process of selection is shown below in Figure 1.

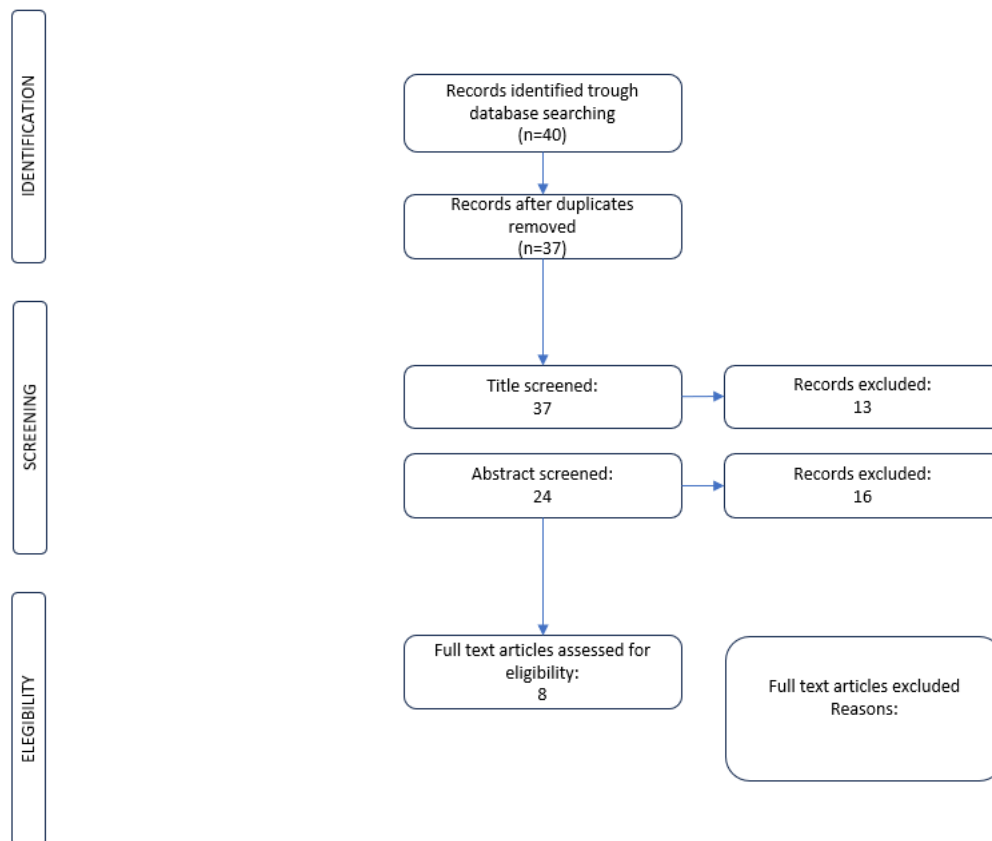


Figure 1. Methodology flowchart.

### 2.4. Data collection

An important aspect considered for selecting the articles was the inclusion of visuals in them. Therefore, the images in these articles were analyzed in a preliminary content

analysis, including the image's content, its thematic significance (if discoverable), and, if relevant, its geographical setting (Jamieson, 2007). The findings from this preliminary analysis can be found in the results section.

Also, the discussion/conclusion sections of each research article have been used to extract information by considering suggestions for future research, which are later used in the results section of this study.

## 2.5. Analysis

According to the “Guidance for conducting systematic scoping reviews” by Peters et al. (2015), depending on the objective or focus of the review, the main conceptual categories can be used to classify the extracted results. Therefore, a comprehensive summary of the relevant research was compiled into a table to facilitate analysis. (Table 2) This provides an organized overview of the main types of visuals, conclusions found, and the target audience from each study.

## 3. Results

### 3.1. Preliminary content analysis

The findings from this preliminary analysis can be found in Table 3.

**Table 3**

*Preliminary content analysis*

<b>Article</b>	<b>Content</b>	<b>Thematic significance</b>	<b>Geographical setting</b>
<b>Manzo, K (2010)</b>	Humans	Political Citizens Environmentalism	Niger Bangladesh
<b>Anne DiFrancesco, D., &amp; Young, N. (2011)</b>	Humans Industry Nature	Political Refinery Polar bears	x
<b>Whitley, C. T., &amp; Kalof, L. (2014)</b>	Nature	Animal vulnerability Animals: In climate adaptation Food animal consumption Human-animal interaction	Antarctic
<b>Schroth, O., Angel, J., Sheppard, S., &amp; Dulic, A. (2014)</b>	Technology	Landscape visualization of climate change effects	x

<b>McMahon, R., Stauffacher, M., &amp; Knutti, R. (2016)</b>	Data visuals	Images from the IPCC summary Open-sourced infographics	x
<b>Roosen, L. J., Klöckner, C. A., &amp; Swim, J. K. (2018)</b>	Visual arts	Time-based media Installations Public art Participatory or socially engaged practices	x
<b>Lc, R., Song, Z., Sun, Y., &amp; Yang, C. (2022)</b>	Data visuals	Comics	x
<b>León, B., Negredo, S., &amp; Erviti, M. C. (2022)</b>	Human Nature	Environmentalist, Citizen Urban landscape affected	x

As shown in Table 3, humans and nature were the most used visuals in the research articles as examples. (León et al., 2022) the study identified principles for effective visual communication on social media, highlighting the importance of showing "real people," telling a story, including a local connection, and showing impacts or actions by people directly affected by fostering user interaction. Similarly, the study by (LC et al., 2022) found that images of people were used to influence climate change attitudes by promoting ideas like future-based thinking, sharing of responsibility, and caring for each other.

Oppositely, Anne di Francesco et al. (2011) analysis discovered that images of people tended to accompany the most thematically bland articles, suggesting that their presence in visual media may not always align with the narrative complexity or depth of the articles.

The second category of most used visuals in the articles was nature, specifically animal images. In this topic, the study by Whitley et al. (2014) examines the representations of animals in popular science narratives of environmental degradation and their role in communicating the impacts of climate change. The study found that National Geographic used various animal representations to make the problem of a changing climate noticeable.

It is also important to mention that in Anne di Francesco et al. (2011) analysis, polar bears are infrequently depicted in their sample (in only three percent of cases). However, according to Slocum, they are "charismatic symbols that can stand alone without text." He mentions that this charismatic quality enables the image to captivate the printed text uniquely compared to other images, which is why they are the most analyzed category of visuals in this group of articles.





Figure 3. Reprinted with permission of The Canadian Press.

Figure in Anne DiFrancesco, D., & Young, N. (2011)



Climate change isn't some threat to the future. It's today's reality. Environmental disasters, such as droughts in Niger are wrecking people's lives with more and more frequency. And it's going to get worse. Want to do something about it? Good, we need people like you. Visit our website to see how you and your workplace can change the world for the better. Climate changed. Let's get to work. [www.climatechanged.org](http://www.climatechanged.org)

Plate 2 'Goat man' – Christian Aid 'Climate changed' advertisement (2007)

Source: Original photograph from Niger by Crispin Hughes for Panos Pictures ([www.panos.co.uk](http://www.panos.co.uk)). Reproduction of advertisement with kind permission of Christian Aid

Figure in Manzo, K (2010)



FIGURE 3 Using data visuals to describe future scenarios in the context of the narrative in Sonia McDougall.

Figure in Lc, R., Song, Z., Sun, Y., & Yang, C. (2022)

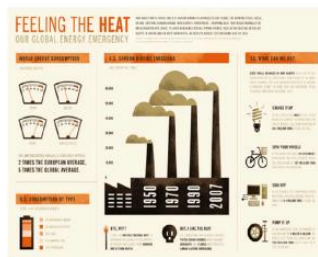


Figure 3. Example of an image that shows 'powerful impacts'. Source: @ClimateReality.

Figure in León, B., Negro, S., & Erviti, M. C. (2022)

(e) A well designed infographic

Source: "Feel the heat", <http://visually>



(f) A poorly designed infographic

Source: "Global Emissions Infographic", <https://www.pinterest.com>

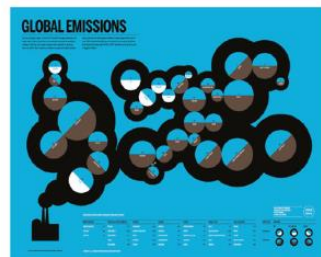


Fig. 1 Visual stimuli. The six visual stimuli used in the study. Visuals (a) to (d) were sourced from IPCC and the remaining, (e) and (f) from the Internet

Figure in McMahon, R., Stauffacher, M., & Knutti, R. (2016)



Figure 4. Jens Galschiot, *Unbearable*, 2015. This artwork displays the connection between the burning of fossil fuels, rising global temperatures, and the extinction of species. The way the polar bear is put on display resembles public execution. The combined effect of all the artwork's elements is to clearly demonstrate the devastating consequences of our use of fossil fuels.

Figure in Roosen, L. J., Klöckner, C. A., & Swim, J. K. (2018)

Appendix Figure 1. Visual Example of Theme: Wild Animal Vulnerability to Climate Change



Source: Paul Nicklen, photographer, "Life at the Edge." *National Geographic*, June 2007: 42–43. Reproduced by permission of Paul Nicklen/National Geographic Creative.

Figure in Whitley, C. T., & Kalof, L. (2014)



Figure 1. Landscape visualization in *Future Delta*, including iconic tree species, atmospheric effects, and dynamics such as falling leaves.  
Source: Aleksandra Dulic.

Figure in Schroth, O., Angel, J., Sheppard, S., & Dulic, A. (2014)

*Examples of the visuals presented in each research article.*

### 3.1.2 Timescale

A total of 8 articles have been examined on the topic of visual elements in climate communication, meeting all the specified criteria for inclusion. The first study in our timescale was conducted by Manzo, K. in 2010, followed by a subsequent publication by Anne di Francesco et al. in 2011. In 2014, two publications were released (Whitley et al., 2014; Schroth et al., 2014), and one article was published by McMahon et al. in 2016 and another by Roosen et al. in 2018. Lastly, two more articles were added to this number with publications from (LC et al., 2022; León et al., 2022). Overall, the number of articles published about visuals in climate communication did not show a significant increase or decrease in our sample.

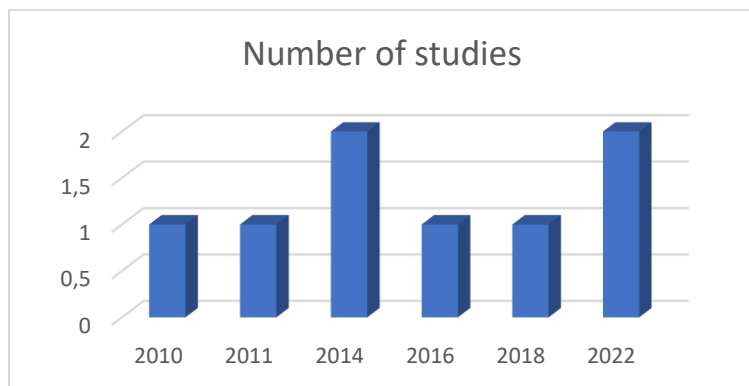


Figure 2. Number of studies of visuals in climate communication

### 3.1.3 Outcome variables

The articles all focus on the impact of visual communication concerning climate change, analyzing different strategies to shape public perceptions and attitudes. However, they differ in their specific variables and measures, including the influence of comics, data visuals, effective visual representation on social media, and visual construction in Canadian print media. Each article offers unique insights into how visual communication influences climate change attitudes and behaviors.

Both research articles by LC et al.(2022) and León et al. (2022) focus on the impact of visual communication on attitudes and perceptions towards climate change, especially in utilizing narratives, data visuals, and principles for effective visual representation on social media. They both explore how visual narratives shape attitudes, perceptions, and behavioral intentions related to climate change while assessing different strategies' effectiveness in engaging audiences.

In the first one, the use of comics as a medium for implicit influence positively impacted the audience's perception of climate change, aligning with pro-climate attitudes such as sharing and future vision. In the second research article, the principles derived from the evidence effectively fostered user interaction on social media, which could potentially influence public engagement with climate change, thus contributing to changing attitudes and perceptions related to the climate phenomenon.

Anne di Francesco et al. (2011) conducted a study that primarily focused on analyzing the linguistic content of articles with and without images during the test period. The study examined themes such as attributions of blame, victimization, crisis metaphors, mentions of rights, future implications, and narrative complexity. Furthermore, the study included an intertextual discourse analysis of selected image-language combinations further to explore the effects of visual and linguistic communication.

In 2010, Manzo conducted a study to showcase how images related to global warming serve as scientific denotations and cultural connotations of danger and vulnerability. The study involved a visual analysis and qualitative examination of climate action campaign imagery to explore the iconography of climate change.

In addition, the outcome variables in the article by McMahon et al. (2016) revolve around the perception of images from the Intergovernmental Panel on Climate Change (IPCC) and open-sourced infographics, assessing the impact of visual design on readers' association with relevant words, confidence levels, and scientific credibility. The research revealed that the visual design of climate science visuals, particularly those from the (IPCC), influenced individuals' perceived confidence and credibility.

Later, Roosen et al. (2018) article discusses the potential effects of climate change-related visual art from a psychological perspective, exploring the psychological impacts, barriers to

change, and aspects of climate change-related art that can trigger long-term changes and group identity.

The publication that examines the outcome measures associated with the impact of interactive 3D visuals in conveying information about climate change is by Schroth et al. (2014). It evaluates changes in approval for local responsibility in tackling climate change through a practical measurement that includes quantitative surveys before and after participating in the game, as well as qualitative discussions with experts.

Finally, the article by Whitley et al. (2014) primarily focuses on analyzing the use and impact of animal imagery in discussions related to climate change. It does not explicitly mention any particular outcome variables. However, the article examines the effect of animal imagery on public perceptions, attitudes, and understanding of climate change within the larger discourse.

### **3.2. Research gaps**

All the examined research has identified areas where knowledge is lacking. Each study put forward various recommendations for future research. This includes exploring the potential of comics as a medium for climate change communication, conducting empirical evaluations of climate change visuals on social media, further investigating the role of visual art in promoting climate change awareness and assessing the impact of imagery and visual narratives on public perceptions and engagement with climate change issues.

Additionally, there is a growing recognition of the need for interdisciplinary collaboration between fields such as design, communication, psychology, environmental science, sociology, and geography (LC et al., 2022). This collaboration aims to develop comprehensive and innovative strategies that address climate change perception and foster meaningful action towards sustainability (Schroth et al., 2014).

There is an emphasis on evaluating the long-term effects of design strategies for climate communication in LC et al. (2022) and León et al., (2022). These studies could reveal whether the influence of comics and data visuals is sustained over time and whether it leads to tangible actions related to climate change. Also in the first article, we find a recommendation to consider the connections between comic narratives and real-life situations to enable readers to identify with and take action on climate change issues.

Another potential area for further research in Anne di Francesco et al. (2011) may involve investigating the influence of visual and linguistic communication on public perceptions of climate change; understanding how visual and linguistic elements shape public perceptions is essential for effective climate change communication. Furthermore, it could involve comparative studies across different media types and outlets to understand variations in visual climate change narratives; these studies could provide insights into how visual climate change narratives vary across different communication channels, resulting in more targeted and impactful messaging strategies for the diverse audiences reached through these channels.

In conclusion, the identified research gaps in the literature review provide a comprehensive roadmap for future studies in climate change communication. The call for interdisciplinary collaboration and the emphasis on evaluating the long-term effects of visual communication strategies highlight the need for complete and sustained approaches to addressing climate change perception and action.

Future research could further investigate comics' potential as a medium for communication, conduct empirical evaluations of climate change visuals on social media, and explore the influence of visual and linguistic elements on public perceptions. Comparative studies across different media types and outlets also present an opportunity to develop more targeted and impactful messaging strategies for diverse audiences.

## **4. Discussion**

This literature review reveals the complex nature of climate change communication, particularly about the use of visual and linguistic elements.

The reviewed literature provides valuable insights into the impact of visual communication on public perceptions and attitudes toward climate change. The studies highlight the diverse strategies and mediums used in visual climate change narratives, such as comics, data visuals, imagery in print media, and social media representation. As a strength of this literature review, we acknowledge that each study offers unique perspectives on the influence of visual communication, covering a wide range of outcome variables, including blame attributions, crisis metaphors, and emotional and moral tones.

Moreover, the research gaps identified in the literature review present a robust roadmap for future studies in climate change communication. The call for interdisciplinary collaboration and the emphasis on evaluating the long-term effects of visual communication strategies highlight the need for comprehensive and sustained approaches to address climate change perception and action.

Future research could further explore comics' potential as a medium for communication, conduct empirical evaluations of climate change visuals on social media, and examine the influence of visual and linguistic elements on public perceptions. Comparative studies across different media types and outlets also offer an opportunity to develop more targeted and impactful messaging strategies for diverse audiences.

Overall, the findings from these studies emphasize the importance of visual communication in shaping public attitudes and behaviors toward climate change. Future research in this area can further contribute to the development of effective and innovative strategies for climate change communication.

## 4.1 Limitations

While the literature review provides valuable insights into the impact of visual communication on public perceptions and attitudes toward climate change, several limitations should be acknowledged.

One of the main drawbacks of this literature review is the small number of articles included in the dataset. The limited sample size raises questions about the applicability of the findings and may limit a thorough grasp of the various strategies and media used in visual climate change narratives.

Therefore, mentioning the low number of articles that included the actual pictures analyzed in the papers points to a limitation in the review. The absence of visual material may impact the depth of analysis and the ability to assess visual communication strategies effectively. The lack of inclusion of visual material may have restricted the review's capacity to provide a detailed evaluation of climate change visuals across different media types.

By recognizing and addressing these limitations, future research can refine and expand the understanding of visual communication's role in shaping public attitudes and behaviors toward climate change.

## 5. Conclusion

This analysis has emphasized the significant impact of visual communication in influencing public perceptions and actions concerning climate change. Further research in this field needs to continue to create productive and original approaches for communicating about climate change.

Overall, the review emphasizes the need for a multifaceted and more meticulous approach to visual climate change communication that considers factors such as audience segmentation, cultural differences, and the use of diverse visual media platforms. Future research should also explore the potential of virtual reality and immersive technologies in climate change communication to enhance audiences' engagement and emotional connection.

***Footnote: For this writing assignment, I used [GenAI tool] Grammarly to provide feedback on my writing style and improve some sentence construction to clarify the reader more. Given that English is not my native language, I use this tool to ensure that my writing will be fully understood.***

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## Appendix

**Table 2. Summary of the relevant research**

Title	Authors	Year	Keywords	Target audience	Type of visuals	Type of analysis	Context	Independent variables	Dependent variables	Conclusion from the authors
Imaging vulnerability: the iconography of climate change	Manzo, K	2010	Climate change Vulnerability Iconography Climate action campaigns	Individuals and public institutions	Images of people, animals, and nature (campaigns)	Semiotic Analysis of Meaning	Explored the iconography of climate change in contemporary climate action campaigns in the UK.	Geopolitical vision of the world reproduced in selected exemplars of climate action campaigns	Effectiveness of climate action campaigns in conveying their political messages.	Iconography can be read as both a scientific early warning sign and a sign of the cultural times
Seeing climate change: the visual construction of global warming in Canadian National Print media	Anne DiFrancesco, D., & Young, N.	2011	Visual communication Ecological issues Narrative complexity	General public (those who consume news through print media)	Images of people, animals, nature, and images of industry or technology	Content and discourse analysis	Examine visual communication in print media coverage of climate change in Canada.	Presence or absence of images in print media articles	Effects of visual and linguistic communication in the presence or absence of images in print media articles.	Presence or absence of an image has a greater impact on the thematic content of the article than the type of image
Animal Imagery in the Discourse of Climate Change	Whitley, C. T., & Kalof, L.	2014	Animal imagery Popular science Visual representation Climate-degraded environments	General public (Mass audience of National geographic)	Images of animals in different settings (in pristine environments, in degraded environments, etc)	Qualitative analysis of images and captions	Examined animal images and captions in all articles on climate change published in <i>National Geographic</i> from 1990 to 2011	Images Themes: -Wild animal vulnerability to climate change - Animals as specimens in climate change adaptation and conservation -Food animal consumption contributes to and is impacted by climate change - Combined livelihoods of draft animals (sled dogs) and their human companions are vulnerable to climate change	Effect of animal imagery on public perceptions, attitudes, and understanding of climate change	Popular science is contributing to an expanded public discourse on climate change that extends beyond the vulnerability of iconic wild megafauna
Visual Climate Change Communication: From Iconography to Locally Framed 3D Visualization	Schroth, O., Angel, J., Sheppard, S., & Dulic, A.	2014	Interactive 3D Imagery Local Responsibility	Students from the University of British Columbia, Okanagan campus and local citizens	3D Landscape visualizations Iconic Images Interactive Images Animation and motion Effects Sound Effects Feedback Visuals	Quantitative questionnaire s and qualitative expert interviews	Used for empirical evaluation. Implemented and tested an alternative approach focusing on recognizable representations of local impacts within an interactive game environment.	The representations of local impacts within an interactive game environment used to communicate climate change	Effects of the exposure to the 3D visuals through a practical measurement that includes quantitative surveys before and after participating in the game, as well as qualitative discussions with experts	Virtual environments can open a space for community discussion and participation, structure experience around positive solutions, and balance the complexity of decision-making in climate change



The scientific veneer of IPCC visuals	McMahon, R., Stauffacher, M., & Knutti, R.	2016	Visual perception Cognition Climate science Visual design Climate students Non-climate students	Individuals with a background in climate science and those without such exposure	Line graphs, images with multiple line graphs, images including globes, and images with maps and infographics	Group – administered study	Examine the perception of images from the IPCC summary report for policymakers and open sourced infographics.	The specific images from the IPCC summary report  Open sourced infographics used in the study	Impact of visual design  Perceived scientific credibility of the visuals	Visual design of climate-related images significantly impacts how they are perceived and understood
Visual art as a way to communicate climate change: a psychological perspective on climate change–related art	Roosen, L. J., Klöckner, C. A., & Swim, J. K.	2018	Pro-environmental behavior Visual art Climate-related art Climate change narratives	General public (can be targeted or staged for specific public)	Traditional visual arts, time-based media, installations, public art, and participatory or socially engaged practices	Comprehensive review	Psychological research literature to explore the potential effects of climate change-related visual art.	X	Changes in attitudes, emotions, and motivations towards climate change	Highlights the importance of narratives and metaphors in art, which can enhance awareness, reflection, and provoke change
Designing narratives and data visuals in comic form for social influence in climate action	Lu, R., Song, Z., Sun, Y., & Yang, C.	2022	Design fiction Data comics Climate change communication	General public, with a focus on those who may be skeptical or apathetic about climate change	Data visuals presented in the form of comics	Online survey	60 readers unfamiliar with climate change themes were being shown comics designed to promote climate action ideas.	Comics created for human-level climate change influence  Promoting ideas like future-based thinking  Sharing of responsibility  Caring for each other	Audience perception of climate change on the human level of goals and desires  Influence on pro-climate attitudes, (sharing and future-vision)	Discussion on the benefits of data visuals for adding credibility and acceptability to narrations in comics
Social Engagement with climate change: principles for effective visual representation on social media	León, B., Negro, S., & Erviti, M. C.	2022	Climate Change Social Media Visual Representation Public engagement Content Analysis	General public, specifically users of social media platforms like Twitter	Images of people Solutions Impacts Protests Scientific images Causes	Content Analysis	Random selection of 380 images to determine the characteristics that foster user interaction.	Characteristics of images fostering interaction on Twitter (showing real people, telling a story, including a local connection, and showing impacts or actions by people directly affected)	User interactions on Twitter as signs of caring or interest.	Emphasizes the importance of effective visual communication of climate change on social media. The study identifies four practical principles that can foster user interaction on social media.