

UNDERSTANDING CLIMATE CHANGE THROUGH THE LENS OF SOCIAL SCIENCE AND HUMAN BEHAVIOR

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ABSTRACT

This review examines the role of social science and human behavior in understanding and addressing climate change, emphasizing the interdisciplinary approach needed to tackle this global crisis. While climate science has provided critical insights into the environmental causes and consequences of climate change, it is the human dimension that often determines the effectiveness of mitigation and adaptation strategies. Psychological factors, such as risk perception and cognitive biases, significantly influence how individuals and communities recognize and respond to climate change. Social norms, cultural contexts, and political ideologies further shape attitudes toward climate action, often determining whether individuals and societies take proactive steps. Additionally, social structures, including political and economic systems, play a pivotal role in framing climate policies and in the allocation of resources to vulnerable populations. The communication of climate change science is equally crucial, as it bridges the gap between complex scientific data and public understanding. Effective communication strategies, including framing climate change in terms of immediate local impacts and addressing ideological barriers, are essential for fostering engagement and action. The review highlights how integrating social science perspectives into climate change research and policymaking can offer more inclusive, context-specific, and effective solutions. A holistic, interdisciplinary approach—leveraging insights from psychology, sociology, economics, and political science—is essential for mitigating the impacts of climate change and promoting sustainable, collective action. The review concludes by emphasizing the need for continued collaboration across disciplines to create policies and strategies that address both the scientific and human dimensions of climate change.

Keywords: climate change, social science, human behavior, risk perception, social norms, climate policy, communication strategies, interdisciplinary approach, environmental psychology, climate action

INTRODUCTION

THE INTERPLAY BETWEEN CLIMATE CHANGE AND SOCIAL SCIENCE

Climate change is perhaps the single most significant problem that humanity is facing today

and will have far-reaching implications for ecosystems, human health, and global economies (Butler, 2018). Although there has been a great deal of growth in what we know about the causes

and consequences of climate change, thanks to scientific research, it is becoming increasingly apparent that it will take more than the scientific study of environmental problems to work through this global predicament. It requires understanding the human angle – how people think, perceive, decide, and what they do about climate change (Herlihy et al., 2016).

Social science, which consists of disciplinary facets such as sociology, psychology, economics, and political science, provides essential insights into human actions and organizations that affect and are affected by climate change (Raihan, 2024). Conventional environmental science frequently looks to the physical underpinnings of climate change; however, it is human behavior—fossil fuel use, clear-cutting, and industrial pollution—that compounds the issue. People’s responses to climate change, from denial to active responses, are heavily influenced by culture, psychology, and society (Jorgenson et al., 2019).

Social sciences are essential for grasping the intricacies of human behavior that drive change, leading to climate change or holding it back. For example, psychological risk perception theories can explain why some people minimize the risks of climate change while others take extreme measures to become more sustainable (Raihan, 2024). Social theories explore how systems of power, politics, and the economy enable or impede climate action. Thus, incorporating social sciences into climate research provides a more complete picture that relates human activities and attitudes to the results in the natural environment (Jorgenson et al., 2019).

Additionally, human society’s reactions to climate change are not straightforward. They are mutable across physical, social, and economic spaces. Recognizing such differences is essential for developing policies and interventions tailored to diverse communities and cultures (Cairney et al., 2023). In this review, we first examine how social science has contributed to the understanding of climate change, considering human behaviors,

social systems, and climate communication (Campbell et al., 2023).

2. HUMAN BEHAVIOR AND CLIMATE CHANGE PERCEPTION

As awareness of climate change is a crucial factor in public views and activities related to the environment, human perception of climate change is considered a key element that influences environmental behaviors (Ćeranić et al., 2023). Scientific agreement with respect to climate change is strong, but public perception and response are shaped by a range of psychological and social factors. People’s receptivity to recognizing and acting on climate change is shaped by perceptions of its risks and the perceived efficacy of potential interventions, as well as their trust in different sources of information (Shin et al., 2022).

Psychological research has shown that cognitive biases (e.g., optimism bias and confirmation bias) also influence climate risk perception. For example, the version of optimism bias is that people think climate change might not affect them personally or that the effects may be overblown. Confirmation bias makes people look for information that confirms their “common sense” and leads to a refusal to take the problem seriously. Such biases can hinder the work of creating a public consensus on the urgency of climate action (Cipriani et al., 2024).

Another important psychological factor is the risk perception as shown in Figure 1. Studies in environmental psychology suggest that how people perceive the risks of climate change depends on their emotional reactions, personal experiences, and cultural influences (Holzhausen & Grecksch, 2021). For instance, those residing in areas that are already facing dire climate events are likely to perceive the urgency of the threat; those who have not felt the direct effects of a crisis could underestimate how bad it is (Van Valkengoed et al., 2024).

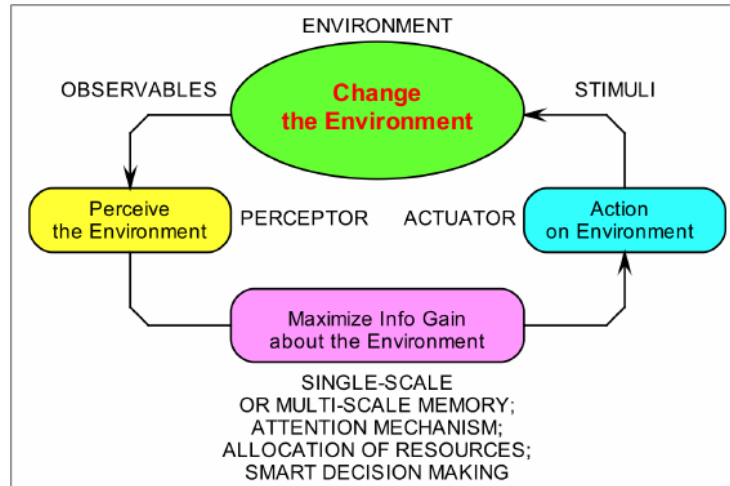


Figure 1: This flowchart depicts a cognitive or system-based model for interacting with the environment. It involves perceiving environmental observables, maximizing information gain, and acting on stimuli to bring about environmental change. The model emphasizes components like memory, attention, resource allocation, and smart decision-making, forming a feedback loop that continuously adjusts actions based on environmental perception. The role of culture and social conventions is also vital in the way climate change is perceived (Van der Linden, 2017). Take communities with powerful environmental movements, for example: There; more people may recognize the urgency of acting on climate change; in contrast, in areas where climate change is highly polarized politically, people are more likely to deny its existence (Doell et al., 2024). Knowing these differences is important for developing communications that will appeal to disparate sets of people. Climate change perception also interacts with ideologies. Political beliefs influence how people interpret climate science. Climate change has been subject to intense politicization in some areas, where there has been resistance to scientific information based on ideological grounds. This has implications for context-sensitive intervention and communication planning (Zeng et al., 2020).

3. THE ROLE OF SOCIAL STRUCTURES IN CLIMATE CHANGE ACTION

Social institutions, such as political regimes, economic systems, and cultural habits, also mediate political responses to climate change as shown in Figure 2 (Davidson et al., 2024). These institutions shape the way societies perceive risk, how policies emerge, and how resources are allocated to climate-related problems. It is essential to understand how social structures shape and influence both obstacles and opportunities for climate action (Kagan & Bromley, 2024).

The nature of political systems makes a big difference during climate policy evolution. In democratic countries, the preferences of the electorate and the policy priorities of elected representatives have tended to influence climate change legal policy (Cole et al., 2022). In authoritarian countries, the process may be top-down, and there may be little to no public involvement. However, climate change is a global challenge that requires cooperation across political lines. Global treaties, such as the Paris Agreement, are attempts to solve climate change but depend on national political will to do so (Omala et al., 2024).

Economies are also key to climate change work. Often, capitalist economies are growth- and expenditure-driven or focused on profit margins at the expense of the environment. For instance, sectors that depend on fossil fuels have economic power, and it becomes challenging to shift to greener ones (Kagan & Bromley, 2024). The status

of an economy regarding sustainability or government interference in markets, for example, may determine how effectively it can pursue climate-friendly policies. The climate change debate frequently revolves around the costs of transitioning to a low- or zero-emissions economy and what a fair burden-share should look like (Hornsey et al., 2025).

Climate change, like social inequality, is also a site of intersection. Poor people and those in the

developing world are among the hardest hit by climate change, even though they have contributed the least to the conditions driving it (Rosa et al., 2023). The effects of climate change are exacerbated by social inequalities, preventing some people from accessing resources and decision-making. This also highlights the importance of climate justice mechanisms that ensure a just and equitable climate response (Malerba, 2022).



Figure 2: This diagram presents a climate adaptation strategy divided into four key areas: (1) Foundations for Success, (2) Safe and Healthy Communities, (3) Climate-ready Economy and Infrastructure, and (4) Resilient Species and Ecosystems. These pillars support a central goal—Climate Preparedness and Adaptation Strategy—aimed at enhancing resilience to climate impacts through integrated planning and action.

4. CLIMATE CHANGE COMMUNICATION: BRIDGING THE GAP BETWEEN SCIENCE AND SOCIETY

Successful communication of climate change is key to public, political, and stakeholder engagement. However, climate change communication is difficult because it requires not only communicating science but also psychology,

culture, and politics, as they shape public perception (Kongnso, 2024).

A big problem for climate communication is that it is abstract and long-term. Climate change can seem like a future threat. This leads to people having a hard time connecting to the issue personally. One technique for addressing this obstacle is to portray climate change in terms of its local effects shortly, such as natural disasters, increasing energy bills, or health threats. It is a way of bringing an issue closer and making it feel more immediate to people (Ali et al., 2023).

Another key to good communication is speaking plainly in a way that is easy to understand. Including visuals, such as infographics, charts, and videos, can help condense complex information and engage the audience (Syakirah et al., 2025).

Stereotypes about climate change are also encouraged by the media. The media often

influences public opinion and reflects climate change debates. However, the media hype can be mixed or exaggerated, creating confusion and doubt. Specifically, the politicization of climate change may be off-putting to some audiences. Consequently, climate communicators must be careful about how they characterize climate change and not further polarize it (Fish & Kreitzberg, 2023). Lastly, social media provides an avenue for mass climate change engagement. However, they also create problems, such as the dissemination of false information and the amplification of fringe opinions. Thoughtful use of social media involves strategies, including fact-checking, amplifying trusted sources, and supporting positive action (Syakirah et al., 2025).

5. FUTURE DIRECTIONS: LEVERAGING SOCIAL SCIENCE FOR CLIMATE CHANGE SOLUTIONS

In looking forward, the role of the social sciences in climate change research and policymaking will be key in addressing the obstacles that stand in the

way of meaningful action (Davidson, 2022). Several productive paths can be taken to further this integration. One of the most fruitful future directions is the creation of behavior change interventions that promote sustainability. Social scientists have found myriad psychological techniques, such as nudging and framing, that can coax people into acting in ways that appear consistent with climate goals. For instance, nudging people into making more energy-efficient choices or adopting low-carbon diets is often a very efficient way to cut emissions and one that does not depend exclusively on policy (Rakhimov et al., 2024).

Another promising avenue is the investigation of social norms and aggregate actions as shown in Figure 3. Research has found that individuals are more likely to engage in pro-environmental behavior if they believe others are doing the same. Using social norms can produce significant changes in behavior in larger groups when positive habits are also rewarded or otherwise boosted by policy or incentives (Steenntjes et al., 2017).

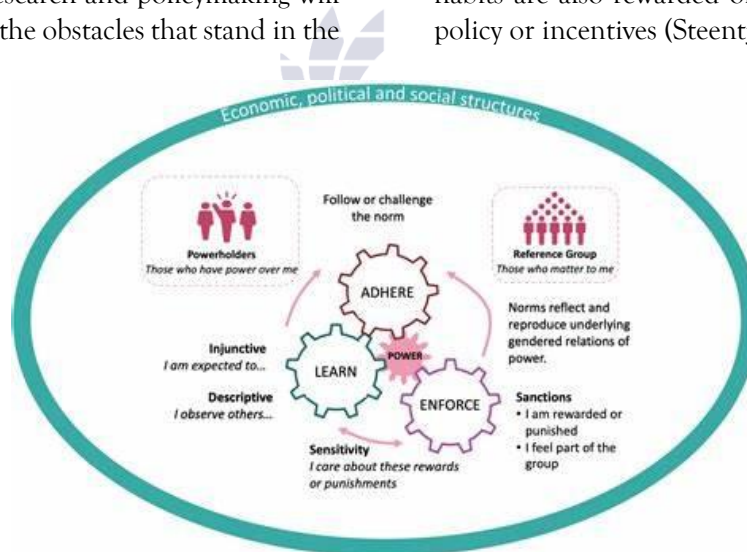


Figure 3: This figure illustrates how social norms are formed and enforced through the interaction of three key elements: learning norms (LEARN), adhering to norms (ADHERE), and enforcing norms (ENFORCE). It highlights the roles of *powerholders* (those with power over others) and *reference groups* (those whose opinions matter), showing how norms are maintained through social expectations, sensitivity to sanctions, and power

relations within broader economic, political, and social structures.

More collaboration between social scientists, policymakers, businesses, and communities will also be important if we are to secure real climate action. Forming multisector partnerships to incorporate social science findings into climate action can help drive better and fairer outcomes. Such partnerships can also help to make climate policies locally rooted and reflexive to the

concerns of the more vulnerable. In summary, social science in the solution to climate change provides excellent prospects for tackling one of our most pressing challenges. Human behavior and social structures are key to creating more successful, equitable, and sustainable approaches to climate change (Davidson, 2022).

6. CONCLUSION

In conclusion, the social science and human behavior department of climate change is crucial for effectively addressing this global challenge. Although environmental science has played a vital role in understanding the causes and effects of climate change, social science is equally important in determining how people respond to the challenge. Human behavior – the product of complex interactions among psychological, cultural, and social factors – plays a significant role in understanding climate change and in the decisions to tackle it at both the individual and government levels. Cognitions, which include risk perception, cognitive biases, and social norms, significantly contribute to people's beliefs in the threat of climate change and their environmental behaviors. Social institutions—political and economic systems—significantly affect how climate policies are conceived and administered and the allocation of resources to vulnerable groups. The more information a brokering service can provide the media, the easier it becomes to communicate with diverse audiences about climate science. In addition, social science may aid in the design of interventions for sustainable behavior and collective action. By integrating social science insights into climate strategies, we can have more inclusive, equitable, and context-specific solutions, as well as solutions that are better suited to dealing with the intricacies of human behavior and societal organization. An interdisciplinary approach (between natural sciences, social sciences, and humanities) will be paramount in the face of the challenges posed by climate change at the local, national, and global levels. Overall, a better understanding of the interaction between social science and climate change is a fundamental step toward mitigating and managing the effects of climate change and ensuring a more sustainable future for everyone.

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