Citizen and Government Review
Vol. 3, No. 2, (2026) 270-280
cjrjournal.com

Politicians and Climate Change: A Bibliometric Analysis

Rossi Maunofa Widayat[1*], Lalu Sopan Tirta Kusuma[2], Muhsin Efendi[3], Sabirin[4], Musmulyadi[5]
[1,2]Department of Government Science, Universitas Muhammadiyah Mataram, Indonesia
[3]Department of State Administration, Universitas Gajah Putih, Indonesia
[4]Department of Communication Science, Universitas Gajah Putih, Indonesia
[5]Sekolah Tinggi Ilmu Hukum Muhammadiyah Takengon, Indonesia
**Corresponding Author: widayatrossi@gmail.com*

ARTICLE INFO

Keyword:

Politician;
Climate change;
Climate policy;
Environmental politics

ABSTRACT

This research aims to carry out an in-depth bibliometric analysis of literature discussing politicians' role in climate change. Using bibliometric methods, this research aims to identify developing research trends, the main focus of research, and the contribution of various countries or regions to the literature. The method includes searching and analyzing relevant documents in academic databases such as Scopus using appropriate keywords such as "politicians and climate change." The analysis tool used is Vosviewer. In its findings, this research reveals that interest in the relationship between politicians and climate change is still limited, although there has been a positive trend in recent years. This trend reflects increasing awareness of the role of politics in addressing increasingly pressing global environmental challenges. The main findings from the discussion on politicians and climate change highlight that politicians' understanding of and responses to these environmental challenges are strongly influenced by political party affiliation, ideology, and the integration of science in the policy process. Though rarely discussed, themes such as climate advocacy, climate politics, climate policy, climate policy, and pollution policy require further attention in future research to fill existing knowledge gaps and lead to more effective policies addressing global climate change's complexities.

INTRODUCTION

Everyone must be involved in efforts to deal with climate change because its impacts are felt by all levels of society without exception. This collective step includes individuals, communities, governments, and the private sector who must work together to reduce greenhouse gas emissions, implement renewable energy, and increase awareness of the importance of sustainability (Christoff et al., 2017; Hügel & Davies, 2020; Rousell & Cutter-Mackenzie-Knowles, 2020). Every action, no matter how small, such as reducing the use of single-use plastic, recycling, or switching to environmentally friendly transportation, has an important role. Active participation from all parties will accelerate achieving effective and innovative solutions to overcome the increasingly urgent climate crisis (Nagel et al., 2019).

Awareness of the importance of the involvement of all parties in climate change mitigation efforts must also be accompanied by intensive education and campaigns. Environmental education from an early age, both at school and in the community, will build a

generation that is more sensitive and responsible for the environment (Eneji et al., 2021). Effective public campaigns can increase public awareness about the impacts of climate change and the importance of preventive action. Mass media, public figures, and influencers are important in disseminating information and inspiring positive action (Lestaluhu et al., 2023). Increasing understanding and awareness will encourage people to participate actively in environmental conservation efforts.

In addition, the government and private sector must work together to create policies and innovations that support sustainability. The government can establish strict regulations and incentives for companies that commit to environmentally friendly business practices. For example, providing tax incentives for companies that reduce carbon emissions or invest in green technology. On the other hand, the private sector must innovate to create more sustainable products and services and implement environmentally responsible business practices. Collaboration between government, the private sector, and society will strengthen collective efforts to deal with climate change and ensure a better and more sustainable future for future generations (Malik et al., 2023).

Politicians have a crucial role in efforts to deal with climate change because they are in a position to create and implement policies that can steer countries toward sustainability (Falck, 2023). Politicians can set stricter emission standards through legislation and regulations, support research and development of environmentally friendly technologies, and provide budgets for green projects. Apart from that, politicians also have a platform to educate and mobilize society and collaborate with global leaders in formulating effective international policies. The commitment and courage of politicians in taking real action on climate change will have a significant impact and become an example for society, showing that directed and consistent collective efforts can overcome this global environmental challenge.

Politicians have an important role in shaping the direction of policies and regulations that can overcome various societal challenges, including climate change (Calyx & Low, 2020). They are responsible for making decisions that reflect the public interest, setting strict emissions standards, and supporting innovation and the development of environmentally friendly technologies. Additionally, politicians have a platform to educate and mobilize the public through campaigns raising environmental awareness (Baharuddin, 2025b). With strong commitment and concrete action, politicians can become leaders in sustainability efforts, build international cooperation, and ensure effective implementation of policies to protect the planet for a better future.

To face climate change, which has far-reaching impacts, the involvement of all parties is necessary. Every individual, community, government, and private sector has an important role in reducing greenhouse gas emissions, implementing renewable energy, and increasing sustainability awareness. Intensive education and campaigns will build a generation that is more sensitive and responsible for the environment. Collaboration between the government and the private sector in creating environmentally friendly policies and innovations will strengthen this collective effort. Politicians, with their strategic positioning, can create and implement policies that steer the country towards sustainability and mobilize society through their platforms. Commitment and real action from all parties will accelerate the achievement of effective solutions to overcome the climate crisis, ensuring a better and more sustainable future for future generations.

This research evaluates published documents related to politicians and climate change by reviewing literature studies available globally. Through bibliometric analysis, this research aims to identify patterns and trends in scientific publications discussing the involvement of politicians in climate change issues, as well as examine the extent of their contribution and influence in scientific and policy discourse. This research will also explore research trends based on the number of documents per year, author affiliation, subject area, citations, theme mapping, and policy recommendation mapping. The results of this research will provide comprehensive insight into the role of politicians in global efforts to deal with climate change and inform more effective policy strategies in the future.

RESEARCH METHODS

The method used in this research is bibliometric analysis using the Scopus database. The choice of Scopus as the main data source in this research was based on several strong reasons. Scopus is one of the largest and most comprehensive academic databases, covering millions of articles from various scientific disciplines and highly reputable journal sources worldwide. The quality and quantity of data available in Scopus allows for in-depth and accurate bibliometric analysis (Baharuddin et al., 2022). In addition, Scopus offers advanced analysis tools that make it easier to track publication trends, collaboration patterns, and citations, providing a more holistic and detailed picture of research topics. Using Scopus, this research can ensure that the data collected is relevant, current, and valid, supporting the aim of evaluating published documents related to politicians and climate change globally.

Identifying the keywords "Politician" and "climate change" in June 2024 produced 19 relevant documents from the Scopus database. The data obtained is then compiled and visualized using automatic database analysis to explore the number of documents per year of publication, author affiliation, and the subject areas most widely covered. This analysis aims to identify publication trends over time, collaboration patterns between authors and institutions, and the dominant research focus in the literature related to politicians and climate change.

Next, the 19 documents will be transferred into the VOSviewer analysis tool to deepen understanding of the main themes raised in this literature. This tool will help map keyword networks and relationships between research topics from existing studies. Using network-based mapping techniques, this research can produce visualizations that reveal theme clusters, keyword centrality, and the direction of research development in politicians and climate change in more detail. The results of this analysis will likely provide deeper and more sustainable insight into the contribution of politicians in facing the challenge of global climate change.

RESULTS AND DISCUSSION

Research Trends: Politicians and Climate Change

Analyzing the number of documents per year that discuss politicians' role in climate change is important for understanding emerging research trends and focuses in this area. This information shows how intense academic attention has been paid to the topic over time. By exploring the number of publications each year, it can be identified whether this issue is receiving increasing attention or experiencing fluctuations in research interest. This not only provides an understanding of how research priorities change over time but can also indicate whether there have been significant developments in understanding or approaches in how politicians approach and respond to the increasingly pressing challenge of climate change. This analysis will provide a strong basis for formulating more effective policies, education, and advocacy strategies to support positive change in this global challenge.

Citizen and Government Review
Vol. 3, No. 2, (2026) 270-280
ISSN 3047-2318

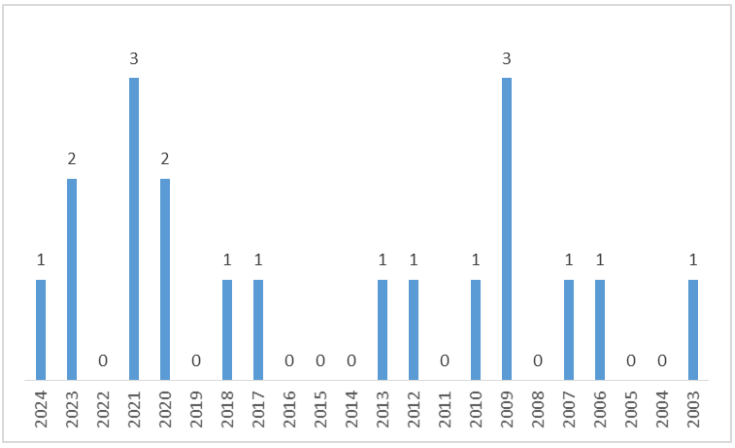


Figure 1. Number of documents per year about politicians and climate change

Figure 1 shows the documentation related to the relationship between politicians and climate change from 2003 to 2024. This data reveals varying trends over time. In the earliest years recorded (2003–2008), the amount of documentation was relatively low, with conspicuous zeros in some years. However, since 2009, there has been a significant increase in the number of documents, peaking in 2019 with three documents and experiencing fluctuations after that. Recent trends show a decline in 2020-2022 before rebounding, with one new document in 2023 and another in 2024, indicating continued interest despite volatility.

Overall, the above data show that interest in studying the relationship between politicians and climate change has increased gradually since the late 2000s, although with significant variations from year to year. This may reflect increased awareness of the role of politicians in setting climate policy, as well as changes in the focus of scientific research on political and environmental issues. Although there are fluctuations in the amount of documentation from year to year, the overall trend shows increasing interest, which may reflect an escalation in global awareness of the importance of political action in addressing climate change.

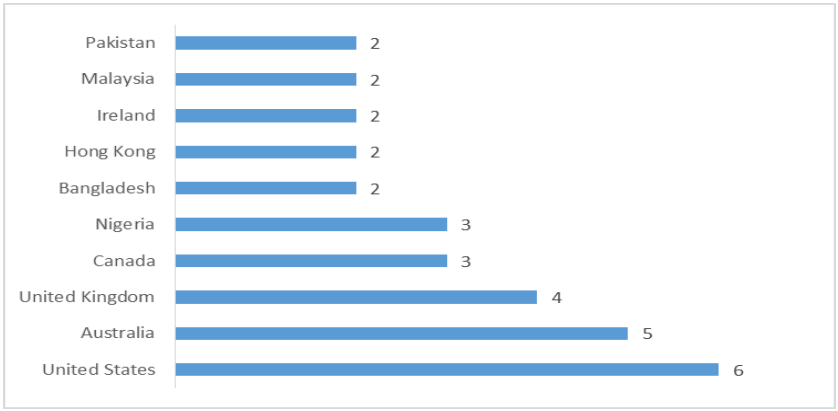


Figure 2. Number of documents based on author's country affiliation regarding politicians and climate change

Figure 2 shows the distribution of the number of documents based on the author's country affiliation relating to politicians and climate change. This data illustrates the contribution of various countries or regions in producing academic literature or research related to this issue. The United States stands out as the largest contributor with six documents, indicating the high level of research activity and studies carried out by authors affiliated with institutions in that country. Australia follows with five documents, indicating a significant interest level in this topic among authors affiliated with institutions there.

Furthermore, the United Kingdom has four documents indicating the strong contribution of affiliated authors in producing literature on politicians and climate change. Canada and Nigeria

each have three documents that consistently focus on research on politicians' involvement in environmental issues. Other countries such as Bangladesh, Hong Kong, Ireland, Malaysia, and Pakistan all have two documents reflecting similar contributions from authors affiliated with those countries in exploring the political aspects of climate change.

Table 1. Dominant Subject Areas Related To Politicians and Climate Change

Subject area	Documents
Social Sciences	10
Environmental Science	5
Medicine	3
Economics, Econometrics and Finance	2
Multidisciplinary	2
Arts and Humanities	1
Business, Management and Accounting	1
Computer Science	1
Earth and Planetary Sciences	1
Psychology	1

Table I shows the dominance of subjects related to politicians and climate change in the literature. The field of social sciences stands out with ten documents, showing a strong focus on aspects of politics, policy, and social behavior in the context of climate change. This reflects an effort to understand how politicians influence and are influenced by environmental issues and their interactions with society in addressing these challenges. The field of environmental science followed with five documents highlighting research on the impacts of climate change on the natural environment and mitigation and adaptation efforts undertaken by politicians.

On the other hand, fields such as medicine, economics, multidisciplinarity, humanities, business management, computer science, earth sciences, and planetary sciences have more limited contributions, with one to three documents each. This shows the diversity of approaches and interest from different disciplines in understanding the role of politicians in responding to climate change, from its impact on human health to the economic and social implications. Overall, these data highlight the importance of cross-disciplinary approaches in understanding and addressing the challenge of climate change, with particular emphasis on social science and environmental science as key pillars in the currently available literature on politicians and climate change.

Data analysis shows that studies of politicians' role in climate change have shown significant trends since the early 2000s. The number of documents created each year has fluctuated, with a significant increase since 2009, reaching a peak in 2019 before decreasing in 2020-2022 and increasing again in recent years. The United States was the largest contributor with six documents, followed by Australia with five documents, and the United Kingdom with four documents. Countries such as Canada and Nigeria have consistently contributed to their respective three documents. Social science subjects dominate this literature with ten documents, while environmental science follows with five documents, reflecting efforts to understand climate change's political, policy, and social implications. This highlights the importance of cross-disciplinary approaches in understanding and addressing this global challenge, emphasizing social and environmental science as central concerns in research and literature on politicians and climate change.

This study also succeeded in mapping the highest number of citations. A high number of citations in scientific literature indicates how often other researchers have cited a work in their publications. It not only measures the popularity of a work but also shows its impact on a particular research field. High citations illustrate that a study or article is important in supporting or expanding existing knowledge and can influence the direction and development of further research. Authors who receive a high number of citations can gain recognition for their contributions in moving the field of science forward and expand collaboration networks with other researchers interested in the same topic (Ibrahim et al., 2023). Overall, a high number of citations is not only an academic achievement but also shows that the work has significantly promoted and developed knowledge in the global scientific community.

Table 2. Number of Citations

Title	Citation
Australian politicians' beliefs about climate change: Political partisanship and political ideology	124
Knowledge and confidence in knowledge about climate change among experts, journalists, politicians, and laypersons	113
When Truth Is Personally Inconvenient, Attitudes Change: The Impact of Extreme Weather on Implicit Support for Green Politicians and Explicit Climate-Change Beliefs	107
Taming the Climate? Corpus analysis of politicians' speech on climate change	46
Politicians must heed health effects of climate change	20

The first document shows that political party affiliation and ideology significantly influence their beliefs about climate change. Politicians affiliated with the Labor Party and the Green Party (center-left and progressive parties) tend to have beliefs that align with the scientific consensus on climate change than unaffiliated or conservative leaders. These results highlight that political ideology (left-right) is the main predictor of politicians' beliefs about climate change (Fielding et al., 2012). These findings illustrate that political partisanship and ideology can be barriers to a broader consensus on climate change and demonstrate the need to build consensus through messages about climate change that advance each party's deeply held values and promote discussion of resolutions -solutions without taking party sides.

The second document describes the differences in knowledge and confidence about climate change between various groups, such as experts, environmental journalists, politicians, and the general public in Sweden. Experts demonstrated the highest level of knowledge, followed by environmental journalists, politicians who chair environmental committees, and the general public. In general, knowledge about the causes of climate change is greater than knowledge about current climate conditions and future consequences. Among future consequences, knowledge of health consequences is lower than that of weather consequences and ocean/glacier changes. Experts also show the highest confidence levels in their knowledge, followed by journalists, politicians, and the general public. However, the adjustment of trust to knowledge is higher among journalists than among experts (Sundblad et al., 2009). These findings highlight that politicians, although in an important position to influence climate change-related policies, have varying knowledge and beliefs, which may influence their approach to this issue and related decision-making.

The third document highlights the impact of direct experience of extreme weather on attitudes toward green politicians and explicit beliefs about climate change among New Jersey residents. Before the two major hurricanes, Participants demonstrated negative implicit attitudes toward green politicians at Time 1. However, their implicit attitudes toward green politicians turned positive after experiencing Hurricanes Irene and Sandy at Time 2. Those significantly impacted by Hurricane Sandy were more likely to support green politicians implicitly. Implicit attitudes were shown to be the best predictor of voting after the hurricane, while explicit beliefs about climate change were the best predictor before the hurricane (Rudman et al., 2013). These findings suggest that direct experience with extreme weather can increase pro-environmentalism and underscore the importance of considering emotional experiences as a source of implicit attitudes. It also suggests that politicians and climate change-related policies can be significantly influenced by personal experiences related to drastic environmental change.

The fourth document reveals that politicians in the UK tend to understand and articulate climate change as an economic and technical issue, with less emphasis on the human and social dimensions. Corpus analysis uses keyword analysis, collocations, and semantic tagging to examine how politicians talk about climate change, particularly in the Climate Change Act 2008 context. Findings show that politicians choose to use scientific evidence selectively, with little discussion

of change that suddenly or cannot be reversed. They tend to "control" climate change rather than face the harsh realities. Although this approach may be more politically acceptable, it reduces space for discussion of climate change's broader political and social implications and hinders more radical responses (Willis, 2017). These findings underscore that political approaches to climate change can limit a holistic understanding and response to this global challenge.

The fifth document highlights the importance of politicians paying attention to the health impacts caused by climate change. The key findings show that politicians often ignore or under-discuss the health impacts of climate change in their rhetoric and policies regarding this issue. Climate change has been proven to significantly impact human health, such as increasing the risk of infectious diseases, the spread of vector diseases, and potentially detrimental psychological impacts. Politicians who do not take these health impacts seriously can result in inadequate policies or a lack of appropriate mitigation efforts (Lim et al., 2009). These findings underscore the need for politicians to expand their understanding of the health implications of climate change and better integrate this health issue into their climate change discussions and policies.

These documents provide a comprehensive picture of the complex dynamics between politicians and the issue of climate change. First, party affiliation and political ideology significantly influence politicians' beliefs on climate change, with center-left and progressive parties tending to support the scientific consensus. Second, differences in knowledge and belief in climate change between experts, journalists, politicians, and the general public highlight varying societal understanding. Third, direct experience with extreme weather, such as Hurricane Sandy, can significantly increase implicit support for green politicians, indicating an emotional impact on attitudes toward environmental issues. Fourth, corpus analysis of British politicians shows that they tend to view climate change as an economic and technical problem, ignoring social and humanistic aspects. Fifth, politicians' importance in paying attention to the health impacts of climate change is emphasized as an often overlooked element in public policy. Overall, these documents demonstrate the complexity of how politicians articulate and respond to climate change and the need for a more holistic and responsive approach to this global challenge.

Research Theme Mapping: Politicians and Climate Change

This section maps several related research themes that influence scholarly discussions about politicians and climate change.

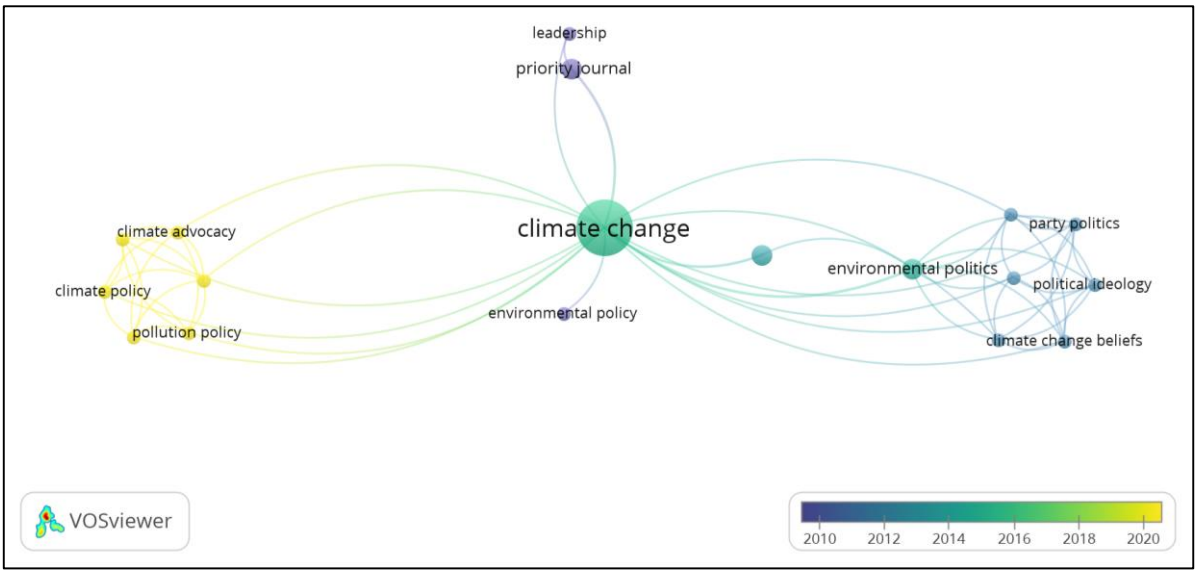


Figure 3. Mapping research themes about politicians and climate change

Figure 3 shows a mapping of research themes related to politicians and climate change, highlighting several themes rarely discussed in this context, namely climate advocacy, climate politics, climate policy, and pollution policy. These themes play a crucial role in understanding how

politicians respond to the challenge of climate change through advocacy efforts, policy formation, and political dynamics that influence political decisions related to climate change. Although important, the limited discussion of these themes suggests that there is still room to explore further how politicians can influence agendas and policies related to climate change and their role in formulating effective responses to this global environmental challenge.

Politicians play an important role in shaping climate advocacy and politics, two interrelated aspects influencing policymaking and public discourse on climate change. Climate advocacy involves politicians' efforts to champion environmental issues, mobilize support for climate action, and influence policy decisions to mitigate and adapt to climate change. Politicians involved in climate advocacy often work with environmental organizations, scientists, and community groups to raise awareness about the urgency of climate issues and push for legislative measures that promote sustainability and resilience.

On the other hand, climate politics encompasses the broader political dynamics surrounding climate change, including negotiations, agreements, and disagreements among political actors at various levels of government. Politicians engage in climate politics through policy debates, international climate meetings, and domestic legislative processes to address climate-related challenges. The effectiveness of climate politics depends on factors such as political will, public opinion, economic considerations, and global cooperation, all of which influence the course of climate policies and initiatives. Overall, climate advocacy and climate politics highlight the diverse roles of politicians in responding to climate change. Their actions and decisions shape national and international policies and influence public attitudes, resource allocation, and strategies to address climate change's impacts on societies and ecosystems globally.

Politicians have a crucial role in setting climate and pollution policies, both of which are important parts of efforts to address environmental challenges, especially climate change. Climate policy refers to the set of regulations, laws, and initiatives governments implement to reduce greenhouse gas emissions, adapt to the impacts of climate change, and encourage sustainable practices. Politicians are key stakeholders in developing and implementing climate policy, influencing decisions through legislative processes, international negotiations, and administrative actions (Iskandar et al., 2024; Karinda & Baharuddin, 2024; Normawati et al., 2024). As the Paris Agreement outlines, effective climate policy requires political leadership, consensus building among diverse stakeholders, and alignment with scientific evidence and global climate goals.

On the other hand, pollution policy focuses on regulations and measures to reduce various forms of pollution, including air pollution, water pollution, and the discharge of hazardous waste. Politicians are important in formulating pollution policies that protect public health, preserve natural resources, and promote environmental justice. These policies often involve balancing economic considerations with environmental protection, requiring politicians to navigate complex trade-offs and interact with industry stakeholders, environmental advocates, and affected communities.

Climate and pollution policies demonstrate the importance of political will and effective governance in addressing environmental challenges. Politicians must engage in evidence-based decision-making, consider long-term sustainability goals, and respond to evolving scientific understanding of environmental issues. By championing strong climate and pollution policies, politicians can create a cleaner and healthier environment for current and future generations while promoting sustainable economic development and social justice.

Based on the discussions that have been held regarding the role of politicians in facing the challenge of climate change, several policy recommendations can be proposed to strengthen responses to this problem. First, politicians must increase the integration of science and scientific evidence in policy decision-making. This includes ensuring that proposed policies are based on a comprehensive understanding of the impacts of climate change and effective solutions. Politicians must strengthen cross-sector and cross-border cooperation to address this challenge holistically, including active participation in international forums such as the UN Climate Change Conference.

Second, politicians must build consensus among various stakeholders, including the general public, industry, and non-governmental organizations, to support ambitious and

sustainable climate policies. This requires the ability to manage differences of opinion and potentially conflicting interests and communicate the long-term benefits of investments in climate change mitigation and adaptation. Politicians also need to strengthen public institutions' capacity and readiness to deal with climate change's impacts, such as improvements in disaster-resilient infrastructure and early warning systems (Baharuddin, 2025a).

Implementing policy recommendations that reflect the integration of science, build consensus, and strengthen institutional capacity has significant implications in dealing with global climate change. Politicians must be prepared to face the complexities and challenges associated with climate change, including adjustments to existing policies to prioritize environmental and public health impacts. Increased international and domestic cooperation will also be needed to address challenges that transcend national borders. In addition, building consensus between various parties will require politicians to be open to inclusive and participatory dialogue so that the resulting policies can be widely accepted and implemented effectively.

Other implications include the need for politicians to take concrete steps to build infrastructure that is sustainable and resilient to climate change and allocate sufficient resources to support green technology innovation and community-based adaptation. By integrating deep scientific understanding and promoting sustainable solutions, politicians can play a key role in creating a safer and more sustainable future for everyone while reducing the negative impacts of climate change on the environment and overall human well-being.

CONCLUSION

The number of documents and distribution by author's country affiliation shows that interest in and focus on the role of politicians in the context of climate change has experienced a significant increase since the early 2000s. Although there are fluctuations in the number of publications from year to year, an overall trend indicates increasing interest in these studies. The United States is the largest contributor to this academic literature, followed by Australia, the United Kingdom, Canada, and Nigeria. Contributions from other countries such as Bangladesh, Hong Kong, Ireland, Malaysia, and Pakistan also reflect a similar level of interest in exploring the political aspects of climate change. This trend reflects an escalation in global awareness of the important role of politicians in addressing the challenge of climate change. This issue is increasingly recognized and studied in depth in international academic literature.

Themes such as climate advocacy, climate politics, climate policy, and pollution policy that are rarely discussed in the context of politicians and climate change require future in-depth research responses to fill existing knowledge gaps. Climate advocacy demands a better understanding of how politicians influence and are influenced by environmental campaigns and advocacy efforts. In contrast, climate politics requires further analysis of how political ideology and party dynamics influence climate policy decision-making. As central to policy responses to climate change, climate policy, and pollution policy require more focused research to explore challenges in effective and sustainable policy implementation. By deepening this understanding, research can make an important contribution to guiding policymaking that is better and more responsive to the complexity of today's global environmental challenges.

Overall, the proposed policy recommendations to strengthen politicians' response to climate change emphasize the importance of integrating science in decision-making, building cross-sector and cross-border consensus, and strengthening the capacity of public institutions. Implementation of these recommendations will not only increase the effectiveness of climate policy and enable politicians to better respond to the complexity of this global challenge by focusing on environmental and public health impacts. Increasing international and domestic cooperation is also crucial in ensuring the sustainability of climate change mitigation and adaptation efforts in the future while integrating green technology innovation and disaster-resilient infrastructure.

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