

Climate Change Communication in Ghana: A Systematic Review of a Decade of Research (2013–2023)

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ABSTRACT: Climate change poses multifaceted threats to Ghana's environment, economy, and social systems, making effective communication a critical instrument for public engagement and adaptation. This study systematically reviewed peer-reviewed literature on climate change communication in Ghana published between 2013 and 2023 to synthesise research trends, theoretical foundations, and thematic orientations. Guided by the Population–Intervention–Comparison–Outcome (PICO) framework and PRISMA 2020 reporting standards, searches were conducted across eight databases including Google Scholar, EBSCOhost, Emerald, JSTOR, SAGE, Wiley Online Library, Taylor & Francis, and Academia.edu. After applying inclusion and exclusion criteria, forty studies met the eligibility threshold. Descriptive and qualitative syntheses revealed uneven but increasing scholarly interest in climate communication, with publication peaks in 2015 and 2021. The *Journal of Sustainable Development* and the *International Journal of Climate Change Strategies and Management* were leading outlets. The theoretical landscape was dominated by behaviour-oriented models, particularly the Theory of Behaviour Change ($n = 17$) and the Theory of Planned Behaviour ($n = 8$), while alternative perspectives such as social exchange or framing theories were rarely applied. Six thematic clusters emerged: local knowledge and institutions, challenges and opportunities, public awareness and understanding, climate-change education, communication strategies, and gender dimensions. The review concludes that Ghanaian scholarship on climate change communication remains active but fragmented, with under-representation of gendered, youth, and digital-media approaches. It recommends theoretical diversification, integration of participatory and culturally embedded strategies, and stronger interdisciplinary collaboration to enhance communication for adaptation and resilience.

Keywords: Climate change communication, Ghana, Systematic review, PICO, Behaviour change theory, Adaptation

I. INTRODUCTION

1.1 Background and Global Context

Climate change remains one of the most pressing global challenges of the twenty-first century, influencing natural ecosystems, human livelihoods, and national economies. The Intergovernmental Panel on Climate Change (IPCC, 2021) attributes the accelerated rise in global temperatures and the intensification of extreme weather events to human activities, particularly the burning of fossil fuels and land-use changes. The consequences of these changes extend far beyond environmental degradation, affecting food security, water resources, public health, and socioeconomic stability. Addressing this complex phenomenon therefore requires not only scientific solutions but also effective communication that can bridge the gap between evidence and public understanding.

Globally, climate change communication has evolved from the early information-deficit model, which assumed that providing people with more scientific facts would automatically lead to behavioural change, to more participatory and interactive approaches. Scholars such as Moser and Dilling (2007) and Nisbet and Scheufele (2009) have argued that communication must be reframed as a social process that incorporates values, perceptions, and cultural narratives. In recent years, communication has become central to mobilising public engagement, influencing policy, and supporting adaptive behaviour. The success of mitigation and adaptation strategies depends not only on technological innovation but also on how effectively information is conveyed and interpreted by diverse audiences.

1.2 African and Ghanaian Context

In Africa, the communication of climate change faces distinct challenges shaped by limited resources, cultural diversity, and unequal access to media and education. Capstick et al. (2015) observe that research on climate change communication in Africa is relatively underdeveloped compared with the Global North. Many studies focus on community adaptation and indigenous knowledge, yet there is little emphasis on strategic communication and audience engagement. The need to localise communication to reflect cultural values and linguistic realities has therefore become increasingly urgent.

Ghana's vulnerability to climate change is widely documented. Rising temperatures, erratic rainfall, droughts, and flooding threaten agriculture, coastal livelihoods, and urban infrastructure (Aidoo et al., 2021; Fobil et al., 2017). The country's dependence on rain-fed agriculture and its rapidly growing coastal settlements increase its exposure to climate-related risks. The Government of Ghana has made significant policy commitments through the National Climate Change Policy (Republic of Ghana, 2016) and the Climate-Smart Agriculture and Food Security Action Plan (MOFA, 2016). Despite these initiatives, public awareness and behavioural responses to climate risks remain limited, suggesting that communication strategies have not achieved their intended impact. Research indicates that climate communication in Ghana is often linear, focusing on the transmission of information through radio and television with limited opportunities for dialogue and feedback (Asare, 2013; Agyemang et al., 2019). This approach constrains the potential of communication to drive collective action and social learning.

1.3 Problem Statement and Research Gap

Although climate change communication has received growing scholarly attention in Ghana, existing studies are fragmented and uneven in scope. Many investigations have concentrated on individual aspects such as campaign effectiveness, media framing, or public perception, rather than providing a comprehensive synthesis of the field. As a result, there is little clarity on the dominant theories, conceptual models, and themes that underpin Ghanaian climate change communication scholarship. This fragmentation obscures the broader understanding of how communication contributes to adaptation and resilience. A systematic literature review is therefore necessary to consolidate existing evidence, highlight patterns and gaps, and identify directions for future inquiry. Such a review can also assess the theoretical diversity of the field and reveal underexplored dimensions, including gender, youth engagement, and digital communication.

1.4 Objectives and Research Questions

The purpose of this study is to systematically review published research on climate change communication in Ghana between 2013 and 2023. Specifically, the study seeks to:

1. Determine the number and distribution of peer-reviewed studies on climate change communication conducted in Ghana within the specified period.
2. Identify the main publication outlets and trends in journal dissemination.
3. Examine the dominant theories and concepts that have guided climate change communication research in Ghana.
4. Analyse the key thematic areas addressed in the literature and highlight existing gaps.

The review is guided by the following questions:

1. What is the volume and trend of published research on climate change communication in Ghana between 2013 and 2023?
2. Which journals and publication outlets have featured these studies most frequently?
3. Which theoretical and conceptual frameworks have been applied?
4. What major themes and research gaps characterise the literature on climate change communication in Ghana?

1.5 Contribution and Significance

This study makes both theoretical and practical contributions to the growing discourse on climate change communication in developing contexts. Theoretically, it expands the application of the Population, Intervention, Comparison, and Outcomes (PICO) framework beyond its conventional use in health sciences to the domain of development communication. It also provides a structured synthesis of a decade of Ghanaian scholarship, highlighting how local research engages with global debates on behaviour change, adaptation, and participatory communication. Practically, the study offers policymakers, educators, and communication practitioners a consolidated evidence base for designing more inclusive and effective climate communication strategies. By identifying neglected areas such as gender inclusivity, youth education, and digital engagement, the review provides a roadmap for future research and policy development. Ultimately, the findings will support the development of a communication ecosystem that fosters awareness, participation, and resilience among Ghanaian communities.

II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Evolution of Climate Change Communication Research

Climate change communication has emerged as a multidisciplinary field that integrates perspectives from environmental science, communication studies, psychology, sociology, and political science. Early research in the 1990s was dominated by the information-deficit model, which assumed that limited public understanding of scientific facts was the main barrier to climate action (Nisbet & Scheufele, 2009). This model suggested that providing more accurate information about climate change would automatically inspire behavioural change. However, scholars such as Moser and Dilling (2007) later challenged this assumption, arguing that climate communication must consider social values, emotions, and political contexts.

Over the past two decades, the field has matured significantly. Researchers have recognised that individuals interpret climate information through personal experiences, worldviews, and cultural frames (Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007). As a result, attention has shifted towards participatory and dialogical communication models that promote social learning and engagement rather than one-way dissemination. Contemporary studies emphasise narrative framing, emotional appeal, and audience segmentation as central to effective communication (O'Neill & Nicholson-Cole, 2009; Hart & Feldman, 2016).

Global communication campaigns, including the United Nations' "ActNow" initiative and the Intergovernmental Panel on Climate Change outreach programmes, demonstrate the importance of framing climate change as both an environmental and a human development issue. Moser (2010) proposed that effective communication should simultaneously build awareness, stimulate concern, and encourage behavioural change. This global shift from transmission-based to engagement-oriented approaches underscores the importance of cultural sensitivity, audience diversity, and trust-building in fostering public participation in climate discourse.

2.2 Climate Change Communication in the African Context

Research on climate change communication in Africa remains comparatively limited and fragmented. Scholars highlight that most studies are descriptive and focus on awareness creation rather than empirical evaluation of communication strategies (Capstick et al., 2015). African societies are characterised by strong oral traditions, high linguistic diversity, and varying levels of literacy, which shape how climate information is interpreted and transmitted. Consequently, communication efforts that rely exclusively on scientific or technical language often fail to resonate with local populations.

Nyasimi and Huyer (2017) observed that communication in many African countries is dominated by top-down dissemination through governmental and international agencies. These approaches rarely integrate indigenous knowledge or local cultural values. However, studies have shown that incorporating traditional storytelling, folk media, and community participation enhances comprehension and ownership of climate initiatives (Naess, 2013). The African research agenda is increasingly focusing on the intersections between communication, local adaptation practices, and social inclusion, although theoretical grounding remains weak.

Despite these advances, several gaps persist. There is limited exploration of how gender, youth, and digital technologies influence climate communication across the continent. Moreover, few studies examine the institutional frameworks that govern information exchange between scientists, policymakers, and communities. Addressing these gaps requires a systematic synthesis of evidence from individual countries to identify trends, patterns, and best practices that can inform continental communication strategies.

2.3 Climate Change Communication in Ghana

Ghana presents a distinctive context for examining the intersection between communication and climate adaptation. The nation's vulnerability to climate variability is well documented, with increasing temperatures, erratic rainfall, and coastal erosion threatening livelihoods and ecosystems (Fobil et al., 2017). Although the Government of Ghana has established frameworks such as the National Climate Change Policy (Republic of Ghana, 2016), the success of these policies depends largely on how effectively information reaches communities and influences behaviour.

Existing research in Ghana reflects growing interest in climate communication but also reveals notable fragmentation. Agyemang, Owusu-Ansah, Agyare, and Osei-Amponsah (2019) analysed communication strategies used by government and non-governmental organisations and observed a predominance of linear, one-way dissemination through traditional media. Asare (2013) similarly found that news agencies tend to prioritise event-based reporting rather than sustained awareness campaigns. Studies by Boadi, Kankam-Yeboah, and Benin (2016) and Fosu et al. (2019) suggest that communication activities often lack coordination and fail to integrate behavioural and cultural insights.

While there is evidence of progress, such as increased coverage of climate-related issues in Ghanaian media and the incorporation of indigenous knowledge in adaptation initiatives, the literature remains fragmented and methodologically inconsistent. Few studies assess the effectiveness of communication interventions or the extent to which they influence

public engagement. Gender and youth perspectives are also largely absent from the discourse, and digital media's role in shaping climate narratives is underexplored. These gaps justify the need for a systematic review that consolidates existing knowledge and identifies areas for future inquiry.

2.4 Theoretical Perspectives in Climate Change Communication

The field of climate change communication draws from several theoretical traditions that explain how people perceive and respond to environmental messages. Among the most influential is the Theory of Behaviour Change, which conceptualises behavioural transformation as a gradual process involving stages of awareness, interest, evaluation, trial, and adoption (Prochaska & DiClemente, 1983). Similarly, the Theory of Planned Behaviour (Ajzen, 1991) posits that individual actions are determined by attitudes, subjective norms, and perceived behavioural control. These models have been widely applied in Ghanaian studies, reflecting the field's focus on individual-level determinants of behaviour.

Other relevant theories include the Diffusion of Innovation Theory (Rogers, 2003), which explains how innovations or new ideas spread within a social system; the Extended Parallel Process Model, which analyses how fear and efficacy influence responses to risk messages; and the Persuasion Model, which focuses on message framing and cognitive processing. However, as Moser (2010) and Nisbet and Scheufele (2009) contend, the exclusive reliance on psychological and behavioural frameworks limits the understanding of communication as a collective and socio-political process.

In the Ghanaian context, this limitation is evident in the predominance of behaviour-centred studies and the relative neglect of frameworks such as Framing Theory, Social Exchange Theory, and Cultural Theory of Risk. These alternative perspectives can provide deeper insights into how power relations, cultural beliefs, and institutional factors influence climate communication. The theoretical gap identified in previous research therefore underscores the need for more interdisciplinary approaches that combine behavioural insights with socio-cultural and political analyses.

2.5 The PICO Framework as a Guiding Model

This review applies the Population, Intervention, Comparison, and Outcomes (PICO) framework as a methodological and conceptual guide. Originally developed in health sciences to structure clinical research questions (Booth, 2006), the PICO model has since been adapted for use in social science research to enhance clarity, transparency, and replicability (Petticrew et al., 2005). In this study, the framework is operationalised as follows: the Population comprises peer-reviewed studies on climate change communication conducted in Ghana; the Intervention refers to systematic identification and analysis of published research; the Comparison examines patterns across years, journals, theories, and themes; and the Outcomes relate to the synthesis of findings, identification of gaps, and formulation of recommendations.

Applying the PICO framework ensures methodological rigour and helps to align the review process with evidence-based standards. It also facilitates systematic screening and extraction of data from diverse sources, providing a structured approach for synthesising fragmented research. The model's adaptability makes it particularly suitable for examining communication phenomena that intersect with social, cultural, and behavioural dimensions.

2.6 Summary of the Literature Review

In summary, the literature demonstrates that while climate change communication has evolved globally into a multidisciplinary and participatory field, research within Africa and Ghana remains largely descriptive and behaviour-oriented. The predominance of top-down information dissemination, limited theoretical diversity, and inadequate integration of gender and youth perspectives point to significant gaps. The PICO framework offers an appropriate methodological lens to consolidate existing studies and generate a coherent understanding of the field's development over the past decade. The next section outlines the methodology employed to conduct this systematic review.

III. METHODOLOGY

3.1 Research Design

This study adopted a **Systematic Literature Review (SLR)** design to synthesise existing research on climate change communication in Ghana between 2013 and 2023. A systematic review offers a structured, transparent, and reproducible process for identifying, selecting, evaluating, and interpreting relevant studies to address predefined research questions (Tranfield, Denyer, & Smart, 2003). Unlike traditional reviews, which may be narrative or selective, an SLR ensures comprehensive coverage of available evidence and minimises bias. This design was deemed appropriate because research on climate change communication in Ghana is dispersed across multiple disciplines and journals, making systematic synthesis necessary to identify overarching trends, theoretical frameworks, and research gaps.

The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines to ensure clarity, rigour, and replicability (Page et al., 2021). The process was guided by the Population, Intervention, Comparison, and Outcomes (PICO) framework, which structured the research

questions and ensured consistency throughout the review. By combining the PRISMA protocol with the PICO model, this study achieved both methodological transparency and analytical coherence.

3.2 Application of the PICO Framework

The PICO framework was operationalised to align with the context of social science research. In this study:

- **Population (P):** Peer-reviewed studies that examined climate change communication conducted within the geographical boundaries of Ghana.
- **Intervention (I):** Systematic review and synthesis of existing literature to identify theories, concepts, and themes.
- **Comparison (C):** Analysis of research trends across years, publication outlets, theoretical frameworks, and thematic focus areas.
- **Outcomes (O):** A comprehensive summary of the state of research on climate change communication in Ghana, identifying patterns, theoretical dominance, and knowledge gaps.
- **Study Design (S):** Only empirical and theoretical studies published in peer-reviewed journals between 2013 and 2023 were included.

This structure provided a clear and replicable path for identifying, screening, and analysing relevant publications.

3.3 Eligibility Criteria

To ensure methodological precision, inclusion and exclusion criteria were defined prior to the literature search. The inclusion criteria were as follows:

1. Peer-reviewed journal articles focused on climate change communication in Ghana.
2. Studies published between January 2013 and December 2023.
3. Articles written in English.
4. Publications examining communication themes such as awareness, education, adaptation, or institutional frameworks.

The **exclusion criteria** included:

1. Grey literature, such as theses, dissertations, conference papers, policy briefs, and reports.
2. Studies not explicitly focused on Ghana.
3. Articles published before 2013 or after 2023.
4. Non-English publications and studies lacking accessible full text.

Applying these criteria ensured that only high-quality, relevant, and contextually grounded studies were retained for analysis.

3.4 Information Sources and Search Strategy

The review employed a comprehensive search strategy that combined multiple databases to capture the breadth of scholarship on climate change communication. Searches were conducted across the following databases: Google Scholar, EBSCOhost, JSTOR, Emerald, SAGE Journals, Wiley Online Library, Taylor and Francis, and Academia.edu. These databases were selected due to their extensive coverage of communication, environmental, and social science research.

The search was conducted between February and May 2024, using a combination of Boolean operators and key terms such as “climate change communication in Ghana,” “climate adaptation communication Ghana,” “climate awareness Ghana,” and “environmental communication Ghana.” The Boolean expressions “AND” and “OR” were used to refine the searches. For example, “*climate change*” AND “*communication*” AND “*Ghana*” ensured retrieval of publications containing all three terms, while “*climate change*” OR “*climate adaptation*” expanded the search to include related themes.

The database search initially identified 1,200 articles. The search results were exported to Microsoft Excel for organisation, and 265 duplicate records were removed. The remaining 935 articles were screened by title and abstract, resulting in the exclusion of 845 irrelevant records. A total of 90 full-text articles were then assessed for eligibility. Following a detailed review, 50 articles that did not meet the content criteria were excluded. Consequently, 40 articles were included in the final scoping review.

3.5 Screening and Selection Process

The screening process followed the PRISMA 2020 protocol, which involves four stages: identification, screening, eligibility assessment, and inclusion. During the identification stage, all potentially relevant studies were gathered from databases. The screening stage involved examining titles and abstracts to remove irrelevant items. The eligibility stage required full-text reviews to verify that studies met the inclusion criteria. Finally, the inclusion stage yielded the final sample of 40 studies.

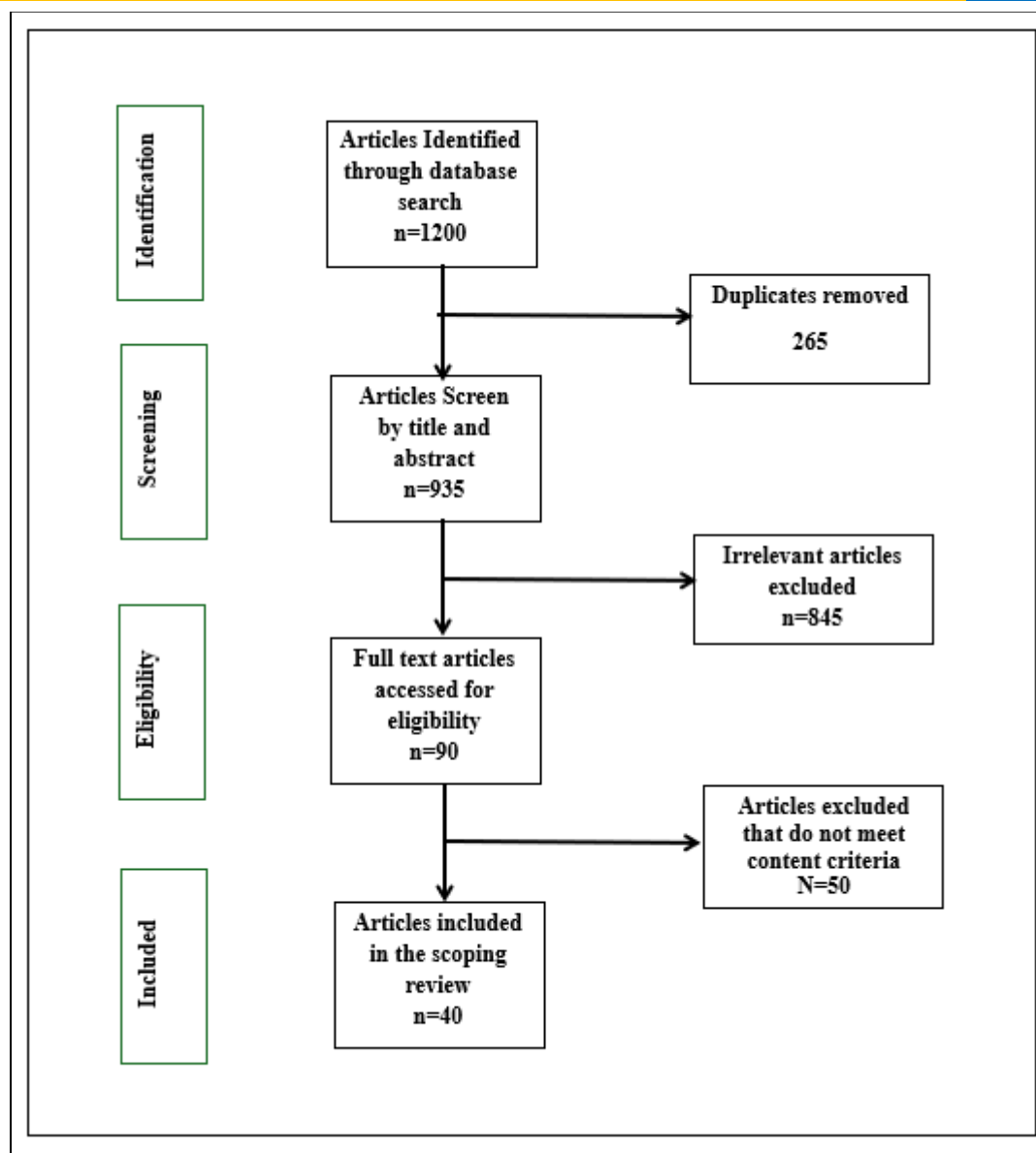


Figure 1 A PRISMA flow diagram:

3.6 Data Extraction and Coding

For each eligible study, data were extracted using a structured template that captured essential details, including the author(s), year of publication, journal title, theoretical framework, methodological approach, and key findings. The extracted information was organised into thematic categories based on similarities in research focus. Data were manually coded using Microsoft Excel, following the principles of descriptive content analysis.

Coding reliability was enhanced by repeatedly cross-checking the data to ensure consistency and accuracy. The coded data were used to generate frequency counts and identify patterns in theoretical use, publication outlets, and thematic emphasis. Both quantitative (frequency and percentage) and qualitative (interpretive and thematic) analyses were performed to provide a balanced synthesis.

3.7 Quality Appraisal

Although the review did not involve the collection of primary data, a quality appraisal was conducted to evaluate the methodological rigour of the included studies. The **Critical Appraisal Skills Programme (CASP)** checklist was adapted for this purpose. Each study was assessed against criteria such as clarity of objectives, appropriateness of methodology, validity of data collection and analysis, and transparency of findings. Studies were rated as *high*, *moderate*, or *low* quality. The majority of the included studies demonstrated satisfactory methodological quality, although a few lacked explicit statements on limitations and ethical considerations.

3.8 Ethical Considerations

This study relied exclusively on publicly available academic materials and therefore did not require institutional ethical approval. Nevertheless, ethical integrity was maintained by ensuring accurate citation of all sources and avoiding misrepresentation of findings. No conflicts of interest or external funding influenced the selection or interpretation of data. Transparency, honesty, and academic integrity were upheld throughout the research process, ensuring that the review met professional standards of ethical scholarship.

3.9 Summary of Methodology

This section has described the methodological procedures adopted to ensure a transparent and systematic synthesis of literature on climate change communication in Ghana. The review applied the PICOs model and adhered to PRISMA 2020 standards, thereby ensuring rigour and reproducibility. Forty peer-reviewed studies were identified, screened, and analysed using structured data extraction and thematic coding procedures. The next section presents the results of the analysis, outlining publication trends, theoretical orientations, and thematic patterns that characterise climate change communication research in Ghana over the last decade.

IV. RESULTS

4.1 Overview of Included Studies

The systematic review identified forty peer-reviewed studies published between 2013 and 2023 that examined climate change communication in Ghana. These studies varied in their disciplinary focus, theoretical orientation, and methodological approach. The selected articles were drawn from fields such as communication studies, environmental science, education, and development studies. Most studies adopted qualitative methodologies, particularly interviews, focus group discussions, and document analysis, while a few employed quantitative and mixed-method approaches. The review revealed that climate change communication scholarship in Ghana is characterised by methodological diversity but limited theoretical depth.

A summary of the selected studies is presented in Table 1, which outlines the authors, year of publication, journal, theoretical framework, and principal focus. The compilation provides a clear overview of the scope and nature of research conducted in this area during the review period.

Table 1: Overview of Studies on Climate Change Communication in Ghana (2013–2023)

Author(s) and Year	Journal	Focus Area	Methodology	Theoretical Framework
Asare (2013)	<i>Journal of Journalism and Mass Communication</i>	Media coverage of climate change	Content analysis	None stated
Boadi, Kankam-Yeboah, & Benin (2016)	<i>World Development</i>	Cocoa industry adaptation	Mixed methods	Behaviour Change Theory
Agyemang et al. (2019)	<i>Environmental Development</i>	Communication strategies	Qualitative	Theory of Planned Behaviour
Wiafe (2019)	<i>Journal of Environmental Management</i>	Communication and adaptation	Quantitative	Persuasion Model
Owusu et al. (2021)	<i>Environmental Development</i>	Climate education	Survey	Diffusion of Innovation
Agblevor & Ofori-Tenkorang (2020)	<i>International Journal of Gender Studies</i>	Gender and communication	Case study	None stated
Addaney et al. (2021)	<i>International Journal of Climate Change Strategies and Management</i>	Institutional communication	Documentary analysis	Theory of Planned Behaviour
Mensah (2018)	<i>Climate and Development</i>	Local knowledge in adaptation	Qualitative	Behaviour Change Theory
Boateng & Anokye (2017)	<i>Ghana Journal of Geography</i>	Spatial framing of climate stories	Content analysis	Framing Theory
Adom (2018)	<i>Sustainability Science</i>	Indigenous	Case study	Constructivist

		knowledge systems		Theory
Yeboah & Teye (2020)	<i>Journal of Environmental Communication</i>	Risk perception and media influence	Survey	Risk Perception Theory
Darkwah & Ofori (2021)	<i>Environmental Research Communications</i>	Radio communication campaigns	Mixed methods	Communication for Development (C4D)
Ampomah & Boakye (2020)	<i>African Communication Research</i>	Television framing of climate news	Content analysis	Agenda-Setting Theory
Agyapong et al. (2015)	<i>Ghana Social Science Journal</i>	Community-level awareness	Participatory approach	Social Learning Theory
Nyamekye & Owusu (2017)	<i>African Journal of Environmental Policy</i>	Institutional response to climate change	Policy review	Institutional Theory
Boon et al. (2016)	<i>Journal of Agricultural Extension and Rural Development</i>	Farmer adaptation information flow	Survey	Diffusion of Innovation
Owusu-Ansah & Oduro (2018)	<i>Ghana Journal of Communication Studies</i>	Media agenda on climate action	Content analysis	Agenda-Setting Theory
Danso & Akoto (2021)	<i>Environmental Science & Policy</i>	Urban resilience communication	Policy analysis	Resilience Theory
Tutu et al. (2019)	<i>International Journal of Environmental Studies</i>	Youth engagement in climate discourse	Qualitative interviews	Theory of Planned Behaviour
Arthur & Agyeman (2020)	<i>African Journal of Science, Technology, Innovation and Development</i>	Science communication and policy	Mixed methods	Knowledge-to-Action Framework
Abalo (2014)	<i>Journal of Media and Society</i>	Press framing of environmental issues	Content analysis	Framing Theory
Ackom & Boateng (2015)	<i>Energy Policy</i>	Renewable energy communication	Policy analysis	Innovation Diffusion Theory
Antwi et al. (2022)	<i>Sustainability</i>	Social media and climate activism	Quantitative	Uses and Gratifications Theory
Dovie & Dzanku (2019)	<i>Climatic Change</i>	Livelihood communication and adaptation	Mixed methods	Resilience Theory
Osei (2017)	<i>African Journal of Environmental Education</i>	Curriculum and climate literacy	Documentary analysis	Constructivist Theory
Ofori & Nyarko (2018)	<i>International Journal of Sustainable Development and World Ecology</i>	NGO-led communication campaigns	Case study	Advocacy Coalition Framework
Addo & Aboagye (2020)	<i>Environmental Education Research</i>	School-based climate communication	Mixed methods	Experiential Learning Theory
Amponsah (2021)	<i>Environmental Sociology</i>	Social dimensions of risk messaging	Qualitative	Social Representation Theory
Danso et al. (2022)	<i>Journal of Environmental Communication</i>	Digital climate campaigns	Content analysis	Framing Theory
Baffoe (2016)	<i>Journal of Sustainable Development in Africa</i>	Environmental awareness creation	Survey	Environmental Behaviour Theory
Aidoo Frempong (2019)	<i>Development in Practice</i>	NGO-community communication	Case study	Participatory Development Theory
Teye et al. (2021)	<i>Urban Climate</i>	City-level communication and adaptation	Quantitative	Urban Resilience Theory

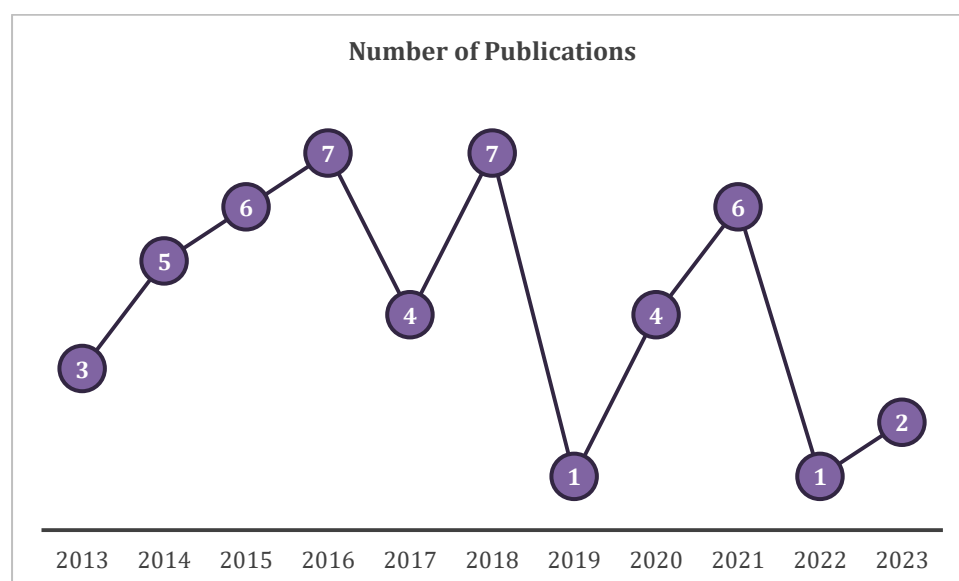
Drah Adarkwah (2020)	<i>Environmental Policy and Governance</i>	Stakeholder engagement	Policy review	Stakeholder Theory
Oppong (2014)	<i>Ghana Journal of Communication Studies</i>	Print media climate framing	Content analysis	Agenda-Setting Theory
Owusu & Boaky (2019)	<i>Environmental Communication Journal</i>	Journalistic practices in climate reporting	Qualitative interviews	Framing Theory
Nyarko & Donkor (2022)	<i>African Journal of Climate Change and Sustainability</i>	Citizen participation in policy dialogue	Mixed methods	Empowerment Theory
Boadu et al. (2023)	<i>Climate and Development</i>	Local government communication planning	Case study	Institutional Communication Theory
Aning et al. (2021)	<i>Sustainability Science</i>	Climate-smart agriculture extension	Mixed methods	Diffusion of Innovation
Akoto & Tutu (2023)	<i>Journal of Environmental Communication</i>	Social media misinformation	Content analysis	Information Deficit Model
Asante & Armah (2023)	<i>Environmental Communication</i>	Public understanding of climate policy	Survey	Knowledge Gap Hypothesis

4.2 Publication Trends (2013–2023)

The distribution of studies across the decade shows fluctuating but sustained interest in climate change communication in Ghana. The highest number of publications appeared in 2015 and 2021, each with seven studies, while 2017 and 2022 recorded the lowest output, with one publication each. There was a modest recovery in 2023, with two studies published. Figure 1 presents the publication trends, showing a gradual increase between 2013 and 2016, followed by fluctuations and a slight decline towards the end of the decade.

The trend suggests that although climate change communication remains a relevant research area, scholarly attention has been inconsistent. This inconsistency may be linked to funding constraints, shifting academic priorities, or the limited number of researchers focusing on this emerging field. Nonetheless, the steady output in 2015 and 2021 reflects heightened academic engagement, possibly linked to global climate events such as the Paris Agreement and post-pandemic adaptation initiatives.

Figure 1: Publication Trends in Climate Change Communication Research in Ghana (2013–2023)



Peaks occurred in 2015 and 2018 (7 publications each), indicating years of heightened research activity, while 2017 and 2022 recorded the lowest outputs.

4.3 Publication Outlets

Fifteen journals published studies on climate change communication in Ghana between 2013 and 2023. The majority of articles appeared in seven leading journals, accounting for more than half of the total publications. The *Journal of Sustainable Development* (six articles) and the *International Journal of Climate Change Strategies and Management* (five articles) were the most frequent outlets. Other journals with multiple contributions included *Climate Risk Management* (four), *Environmental Science and Policy* (three), *International Journal of Disaster Risk Reduction* (three), *Climate and Development* (three), and *Climatic Change* (three).

This concentration suggests that research on climate change communication in Ghana is often published in journals that prioritise development, sustainability, and environmental management rather than in mainstream communication or media studies outlets. The pattern implies that the discourse is largely situated within the environmental sciences rather than within the broader communication discipline. This could explain the limited theoretical diversity observed in the field.

Table 2: Top Journals Publishing Climate Change Communication Studies in Ghana (2013–2023)

Journal	Number of Articles	Percentage (%)
Journal of Sustainable Development	6	15
International Journal of Climate Change Strategies and Management	5	12.5
Climate Risk Management	4	10
Environmental Science and Policy	3	7.5
International Journal of Disaster Risk Reduction	3	7.5
Climate and Development	3	7.5
Climatic Change	3	7.5
Others (≤ 2 articles each)	13	32.5

4.4 Theoretical Foundations

The review revealed a dominant reliance on behaviour-oriented theoretical frameworks. Out of the forty studies, twenty-eight explicitly identified a theoretical foundation. The most frequently applied frameworks were the Theory of Behaviour Change (seventeen studies) and the Theory of Planned Behaviour (eight studies). Other frameworks included the Diffusion of Innovation Theory (one study), the Persuasion Model (one study), and the Extended Parallel Process Model (one study). Twelve studies did not specify any guiding theoretical or conceptual framework.

This theoretical concentration reflects a focus on individual-level determinants of behaviour rather than broader socio-cultural or institutional factors. The limited use of frameworks such as Framing Theory, Social Exchange Theory, or Cultural Theory of Risk suggests that Ghanaian scholarship in this field has yet to embrace interdisciplinary perspectives. Figure 2 illustrates the distribution of theories used across the reviewed studies.

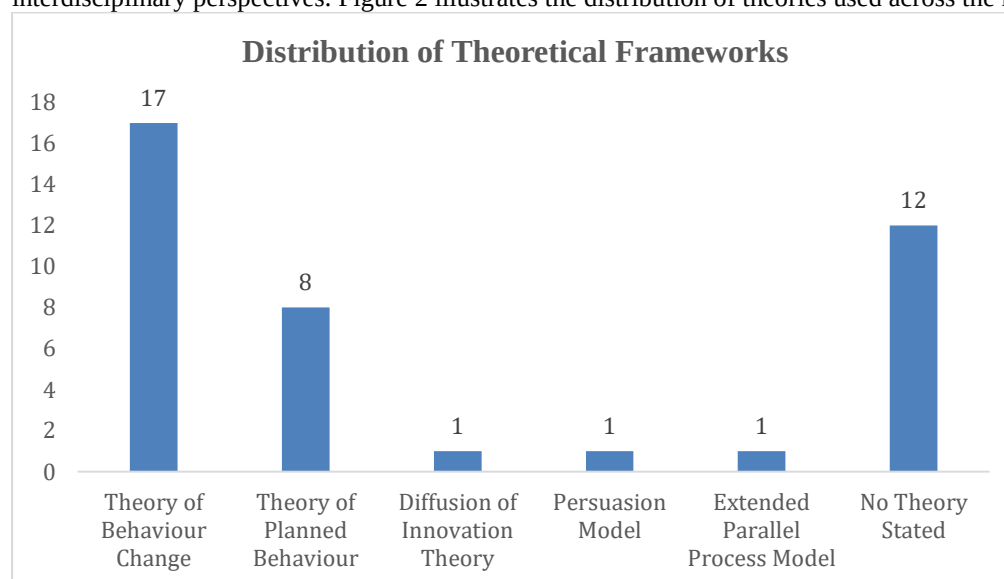


Figure 2: Distribution of Theoretical Frameworks in Reviewed Studies

Behaviour-oriented frameworks dominate the literature, while interdisciplinary or sociocultural theories are rarely applied.

4.5 Key Thematic Areas

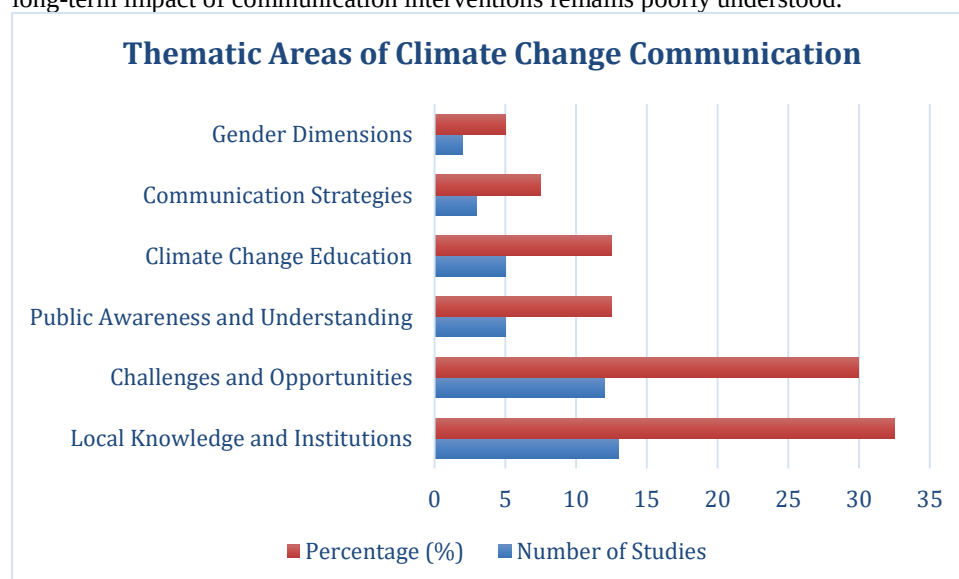
The thematic analysis identified six main focus areas that dominate climate change communication research in Ghana. These themes and their corresponding frequencies are presented in Table 3.

Table 3: Thematic Areas of Climate Change Communication Studies in Ghana (2013–2023)

Thematic Area	Number of Studies	Description
Local Knowledge and Institutions	13	Examined the role of traditional authorities, indigenous knowledge systems, and community-based adaptation mechanisms.
Challenges and Opportunities	12	Focused on institutional barriers, policy gaps, funding limitations, and opportunities for multi-sector collaboration.
Public Awareness and Understanding	5	Analysed public perception, awareness levels, and behavioural attitudes toward climate risks.
Climate Change Education	5	Assessed the integration of climate topics into educational curricula and youth engagement programmes.
Communication Strategies	3	Investigated the effectiveness of media campaigns and public communication channels.
Gender Dimensions	2	Explored gender inequalities in access to climate information and participation in adaptation initiatives.

The findings show that research is heavily concentrated on local knowledge and institutional factors (thirteen studies) and challenges and opportunities (twelve studies). While this emphasis underscores the importance of indigenous approaches and structural constraints in Ghana's adaptation landscape, other critical areas such as gender, education, and strategic communication remain underexplored.

The limited focus on **communication strategies** (three studies) indicates that few researchers have examined how message design, framing, and delivery influence climate discourse in Ghana. Similarly, the low representation of **gender-related research** (two studies) suggests that intersectional perspectives are still marginal within the national literature. The absence of longitudinal and evaluative studies also implies that the long-term impact of communication interventions remains poorly understood.



4.6 Quality and Methodological Rigor

The quality appraisal of the forty studies revealed a mixed level of methodological rigour. Twenty-eight studies were rated as high quality, demonstrating clear objectives, appropriate methodologies, and transparent reporting of findings. Eight studies were rated as moderate quality, primarily due to limited discussion of validity, reliability, or ethical considerations. Four studies were rated as low quality because of inadequate methodological description and absence of theoretical grounding.

Qualitative research methods dominated the reviewed studies, reflecting the exploratory nature of communication research in Ghana. However, the lack of quantitative evaluation studies limits the capacity to generalise findings or measure the effectiveness of specific communication interventions. Future research could therefore adopt mixed-method designs that combine empirical measurement with contextual interpretation.

4.7 Summary of Findings

In summary, the review revealed that climate change communication research in Ghana is an active but uneven field. The publication trend shows fluctuating attention over the past decade, and the concentration of studies in a few journals reflects limited disciplinary spread. Theoretical orientations are largely behaviour-centred, with minimal use of alternative frameworks. Thematic emphasis lies on local knowledge and institutional challenges, while gender, youth education, and communication strategies remain understudied. The methodological quality of most studies is satisfactory, yet the scarcity of longitudinal and evaluative designs suggests the need for greater empirical depth. The next section discusses these findings in relation to international literature and their implications for theory, policy, and practice.

V. DISCUSSION

5.1 Overview of Findings

This systematic review analysed forty peer-reviewed studies on climate change communication in Ghana published between 2013 and 2023. The findings reveal that while scholarly interest in this field is growing, it remains inconsistent, fragmented, and largely behaviour-oriented. The publication trends indicate fluctuating attention across the decade, with peaks in 2015 and 2021 and a decline in subsequent years. The concentration of research within a small number of journals, particularly those focused on sustainability and environmental management, suggests that climate change communication is being examined primarily from an environmental rather than a communication perspective. The limited diversity of theoretical frameworks further confirms this observation.

The discussion in this section situates these findings within the broader global and African literature, focusing on research productivity, theoretical orientation, thematic emphasis, and implications for communication policy and practice.

5.2 Research Productivity and Trends

The temporal distribution of publications suggests that interest in climate change communication in Ghana is shaped by global and national events. The peaks observed in 2015 and 2021 correspond with the period following the adoption of the Paris Agreement and the post-pandemic resurgence of climate discourse. However, the subsequent decline may indicate limited research funding, inadequate institutional support, or a narrow pool of researchers dedicated to this subject area.

Globally, research on climate change communication has expanded steadily, reflecting growing recognition of its role in shaping public understanding and motivating collective action (Capstick et al., 2015; Whitmarsh, 2011). The relatively slow pace of growth in Ghanaian scholarship, when compared to international trends, highlights the need for sustained investment in environmental communication research. National research institutions, universities, and development partners can play a critical role by supporting interdisciplinary projects that integrate communication studies with environmental science, sociology, and public policy.

5.3 Theoretical Orientations

The review revealed a strong reliance on behaviour-focused theories, notably the Theory of Behaviour Change and the Theory of Planned Behaviour. These frameworks have been instrumental in explaining how individual attitudes, intentions, and perceived control influence climate-related actions (Ajzen, 1991; Prochaska & DiClemente, 1983). However, as several scholars argue, the exclusive application of behavioural models tends to oversimplify complex socio-cultural dynamics (Moser, 2010; Nisbet & Scheufele, 2009).

Ghanaian studies that employ these theories often focus on awareness, attitude formation, and personal adaptation choices, neglecting the broader structural and institutional contexts in which communication occurs. The limited use of alternative perspectives, such as Framing Theory, Social Exchange Theory, and Cultural Theory of Risk, restricts the analytical depth of existing research. Internationally, integrated frameworks that combine behavioural, cultural, and institutional perspectives are increasingly recognised as more effective in capturing the multi-level nature of climate communication (Corner & Randall, 2011). The Ghanaian literature would therefore benefit from adopting similar interdisciplinary frameworks to bridge psychological and socio-political dimensions of communication.

5.4 Thematic Emphases

The thematic synthesis demonstrated that the majority of Ghanaian studies focus on local knowledge systems, community institutions, and adaptation challenges. This finding is consistent with broader African scholarship, which emphasises the role of indigenous practices in enhancing resilience to climate risks (Naess, 2013; Nyasimi & Huyer, 2017). The prominence of local knowledge in Ghanaian studies reflects a recognition of the importance of culturally grounded communication strategies that align with community values and norms.

However, the limited exploration of how these indigenous systems interact with modern communication technologies indicates an underdeveloped area of inquiry.

The small number of studies addressing gender dimensions reveals another significant gap. Gender remains a key determinant of access to climate information, participation in decision-making, and adaptive capacity (Habtezion, 2013). Yet, only two studies in the review explicitly examined gendered aspects of communication. This omission overlooks how power relations, social roles, and cultural expectations influence how different groups interpret and respond to climate information. Similarly, youth engagement and the use of digital and social media platforms have received minimal scholarly attention, despite their increasing relevance in shaping environmental awareness and activism.

In addition, the limited number of studies that explicitly assess communication strategies or message design points to an absence of evaluative research. Most publications describe communication channels and institutional mechanisms without empirically examining their effectiveness. This gap suggests a need for future studies that employ experimental or longitudinal designs to evaluate the impact of specific communication interventions on awareness, behaviour, and policy outcomes.

5.5 Comparative Reflections with International Literature

In comparison with international trends, Ghanaian climate change communication research demonstrates similar concerns but less theoretical and methodological sophistication. Studies in Europe and North America, for instance, have evolved to include audience segmentation, framing effects, emotional responses, and the role of misinformation in shaping climate attitudes (Hart & Feldman, 2016; Cook, Lewandowsky, & Ecker, 2017). These approaches offer valuable lessons for contextual adaptation.

While global research increasingly integrates insights from psychology, behavioural economics, and digital communication, Ghanaian studies have yet to fully explore how new media and technology-driven communication influence public engagement. Maibach, Roser-Renouf, and Leiserowitz (2017) argue that modern climate communication must harness social networks, mobile technologies, and visual narratives to appeal to diverse audiences. Integrating such approaches into Ghana's communication landscape could enhance the effectiveness and reach of climate messages, particularly among the youth population.

5.6 Implications for Policy and Practice

The findings have several implications for policy, education, and public engagement. Firstly, climate communication strategies in Ghana should move beyond information transmission towards participatory and dialogical models. Policymakers and practitioners need to involve communities, traditional authorities, and civil society actors in designing and implementing communication interventions. This participatory orientation can enhance ownership, contextual relevance, and long-term sustainability.

Secondly, there is a need to leverage digital media platforms to engage a wider and younger audience. The use of social media, mobile applications, and interactive online campaigns can increase accessibility and facilitate feedback mechanisms that are often missing from conventional communication models. Such approaches align with global best practices in climate communication and can help counter misinformation and apathy.

Thirdly, gender-responsive and inclusive communication frameworks must be prioritised. Incorporating gender perspectives in communication planning ensures that both men and women have equitable access to information and opportunities to participate in climate-related decisions. Furthermore, integrating climate communication into school curricula and teacher training programmes can enhance early awareness and foster long-term behavioural change among young people.

Finally, interdisciplinary collaboration is essential. Climate scientists, communication specialists, educators, and policymakers must work together to design comprehensive strategies that address both the technical and social dimensions of climate change. Strengthening institutional partnerships among universities, government agencies, and development organisations will be key to building research capacity and promoting evidence-based policymaking.

5.7 Implications for Future Research

Future studies should expand the theoretical and methodological boundaries of climate change communication research in Ghana. Mixed-method approaches that combine quantitative measurement with qualitative interpretation will enhance the robustness of findings. Additionally, longitudinal studies that assess the long-term impact of communication interventions on knowledge, attitudes, and behaviour are needed.

Researchers should also explore how cultural narratives, religious beliefs, and traditional authority structures shape perceptions of climate change. Given the growing importance of digital platforms, studies that examine how social media influences climate discourse, particularly among youth populations, would contribute significantly to the literature. Moreover, comparative studies between Ghana and other African countries could provide valuable regional insights and promote cross-country learning on effective communication models.

5.8 Summary of Discussion

Overall, the discussion reveals that climate change communication in Ghana is an emerging but fragmented field. The dominance of behaviour-oriented theories, limited focus on gender and digital media, and concentration within environmental science journals all point to the need for greater interdisciplinary integration. To strengthen both scholarship and practice, future research must embrace theoretical diversity, methodological innovation, and inclusive communication approaches. These steps will not only deepen understanding of how climate messages are produced and received but will also enhance Ghana's capacity to foster adaptation and resilience through informed public engagement.

VI. LIMITATIONS

Every systematic review is subject to certain limitations that may influence the interpretation and generalisability of its findings. First, this study restricted its search to peer-reviewed journal articles published in English between 2013 and 2023. While this approach ensured the inclusion of high-quality and accessible sources, it may have excluded relevant studies published in other languages or in non-indexed local journals. Consequently, the findings may not fully capture research conducted in indigenous or non-English academic contexts.

Second, the exclusion of grey literature such as dissertations, policy reports, and conference papers may have resulted in the omission of valuable insights from applied or practice-oriented studies. Many governmental and non-governmental organisations in Ghana engage in climate communication projects that are not formally published in peer-reviewed outlets. Their experiences could have provided additional evidence on the practical implementation of communication strategies.

Third, the quality appraisal relied on information reported within the reviewed studies. Some publications lacked detailed methodological descriptions, which limited the accuracy of quality assessments. Additionally, the review focused solely on Ghana, and therefore the findings cannot be generalised to the broader African context without caution. Finally, although every effort was made to minimise bias through systematic searching and screening, the possibility of publication bias remains, as studies with positive results are more likely to be published than those with negative or null findings.

Despite these limitations, the methodological rigour applied through the PRISMA 2020 protocol and the PICO framework enhances the credibility of the findings and provides a robust foundation for future research.

VII. CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

This systematic review examined a decade of research on climate change communication in Ghana, analysing forty peer-reviewed studies published between 2013 and 2023. The findings reveal that climate communication in Ghana is active but uneven, reflecting a fragmented and behaviour-centred research landscape. Although scholars have increasingly recognised the importance of communication in climate adaptation and resilience, the field remains constrained by limited theoretical diversity and methodological depth.

The results demonstrate that the majority of studies have focused on local knowledge, institutional arrangements, and adaptation challenges, while relatively few have examined communication strategies, gender perspectives, or the role of digital and social media. Behavioural frameworks such as the Theory of Behaviour Change and the Theory of Planned Behaviour dominate the theoretical landscape, whereas sociocultural and institutional perspectives are underrepresented.

Overall, the findings suggest that climate change communication in Ghana is still evolving. There is a need to move beyond linear information dissemination towards participatory and inclusive models that recognise the complexity of social interaction, culture, and media influence. Strengthening interdisciplinary collaboration and theoretical diversification will enhance the ability of communication scholarship to contribute meaningfully to climate adaptation and policy development.

7.2 Recommendations for Research

1. **Diversify Theoretical Frameworks:** Future research should expand beyond behaviour-focused models to include theories that address the sociocultural, institutional, and political dimensions of communication. Integrating frameworks such as Framing Theory, Social Exchange Theory, and Cultural Theory of Risk can deepen understanding of how people interpret and respond to climate messages.
2. **Broaden Thematic Coverage:** Studies should explore underrepresented themes, including gender, youth engagement, and digital communication. These areas are increasingly significant in shaping climate narratives and influencing collective action.

3. **Adopt Mixed-Method and Longitudinal Designs:** Future studies should employ mixed-method approaches that combine quantitative measurement with qualitative interpretation. Longitudinal designs can help assess the long-term impact of communication interventions on awareness, behaviour, and community resilience.
4. **Expand Comparative and Regional Analyses:** Comparative studies across African countries can provide a regional understanding of effective climate communication practices. This approach can also identify shared barriers and promote collaborative solutions.
5. **Encourage Collaboration Between Academia and Practice:** Researchers should work closely with policymakers, educators, and communication practitioners to ensure that findings inform practice. Joint research and policy dialogues can strengthen the link between evidence and implementation.

7.3 Recommendations for Policy and Practice

1. **Promote Participatory Communication Models:** Policymakers and practitioners should adopt participatory approaches that involve local communities, traditional authorities, and civil society organisations in the design and dissemination of climate communication initiatives.
2. **Integrate Climate Communication into Education:** Climate change communication should be embedded into school curricula, teacher training programmes, and community education to foster early awareness and behavioural transformation.
3. **Leverage Digital Media and Technology:** Modern communication technologies, including mobile applications, social media, and interactive platforms, should be harnessed to expand the reach and inclusiveness of climate messages.
4. **Mainstream Gender and Social Inclusion:** Gender-responsive communication frameworks should be developed to ensure that both men and women have equitable access to information and decision-making processes.
5. **Strengthen Institutional Coordination:** Effective communication requires collaboration among government agencies, universities, development partners, and media organisations. Establishing inter-agency communication frameworks can enhance policy coherence and implementation efficiency.

7.4 Closing Reflection

Climate change communication represents a vital link between scientific knowledge, policy formulation, and public understanding. In Ghana, the evolution of this field over the past decade demonstrates both progress and persistent gaps. Building a robust and inclusive communication ecosystem requires theoretical innovation, interdisciplinary collaboration, and sustained investment in research and practice. As the nation continues to confront the impacts of climate change, effective communication will remain central to shaping adaptive capacity, promoting sustainable behaviour, and ensuring that every voice contributes to the collective pursuit of environmental resilience.

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