



BRIDGING THE CLIMATE AWARENESS GAP: HOW LOCAL LANGUAGES TRANSFORM PUBLIC UNDERSTANDING IN PAKISTAN

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Abstract

Climate change is one of the most pressing challenges facing the world today, and Pakistan is among the countries most vulnerable to its impacts. The nation experiences frequent floods, heatwaves, and agricultural losses, which threaten both human lives and economic resources. Effective climate communication requires more than merely conveying information; it must ensure that messages are accessible, culturally relevant, and understandable to diverse communities. Pakistan's rich multilingual landscape, encompassing languages such as Punjabi, Sindhi, Saraiki, Balochi, and Pashto etc, provides an important opportunity for enhancing public understanding of climate change. Based on available studies, this review explores the potential of local languages to enhance climate awareness in Pakistan, while also highlighting that limited use of regional languages has constrained the reach and effectiveness of climate messages. A thematic review approach was employed, analyzing peer-reviewed studies, government reports, and NGO publications to identify patterns, strengths, and gaps in current research. The study highlights how regional language communication enhances comprehension, fosters trust, and encourages community engagement. The role of social media and other contemporary platforms in disseminating climate awareness is also considered. Findings indicate that while national campaigns often rely on English or Urdu, incorporating local languages significantly improves the reach and impact of climate messaging. The study concludes that prioritizing linguistic diversity in climate communication strategies is essential for bridging Pakistan's climate awareness gap and promoting sustainable environmental practices.

Keywords: *Climate Change Awareness, Climate Communication, Community Engagement, Linguistic Diversity, Local Languages, Pakistan, Public Understanding*

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1. Introduction

Pakistan is recognized as one of the United Nations member states most vulnerable to the adverse effects of climate change. Over the past few decades, the country has faced multiple climate-induced disasters, including devastating floods, prolonged heat waves, and severe droughts. These environmental challenges have not only claimed thousands of lives but have also caused significant damage to livestock, biodiversity, and agricultural productivity. In particular, shifts in climatic patterns have disrupted traditional farming cycles, reduced crop yields, and contributed to economic instability and food insecurity. Pakistan has recently been ranked as the most climate-vulnerable country in the world for 2022 according to the Climate Risk Index 2025 report, primarily due to catastrophic monsoon floods that submerged nearly one-third of the country, affected over 33 million people, and resulted in economic losses exceeding USD 30 billion (Germanwatch, 2025). More recently, United Nations reporting indicates that the 2025 monsoon floods have impacted more than six million people, displaced approximately 2.5 million, and created a severe humanitarian crisis across multiple provinces (United Nations, 2025).

In response to these pressing issues, print and electronic media, together with digital platforms, have frequently run campaigns promoting tree planting, environmental protection, and climate awareness. Recent research indicates that media does not merely report environmental issues; rather, it constructs climate realities through linguistic choices, framing techniques, and rhetorical devices (Nazeer et al., 2024). Such discourse influences public perceptions of urgency, responsibility, and possible mitigation strategies, thereby affecting how communities respond to climate challenges.

Recent eco linguistic research further emphasizes that media discourse actively shapes climate understanding rather than simply transmitting scientific information. Through framing strategies, metaphors, and narrative choices, media texts influence how climate change is interpreted, emotionally experienced, and morally evaluated by audiences (Saleem & Khan, 2025). These linguistic and ideological patterns demonstrate that language is far from neutral; it conveys cultural meanings and ideological perspectives. When climate narratives are conveyed only through dominant languages, they risk marginalizing local perspectives and limiting public engagement. This insight reinforces the argument that effective climate communication in Pakistan must move beyond mainstream linguistic frameworks and incorporate local languages to create culturally resonant and inclusive climate awareness.

The growing use of smartphones in Pakistan has further expanded opportunities for communication. Platforms such as Facebook, Instagram, TikTok, and YouTube enable the dissemination of climate awareness through concise, engaging, and culturally relevant content. Integrating local languages into both traditional and digital media can enhance comprehension, build trust, and encourage community involvement. Therefore, this study

highlights the importance of combining linguistic diversity with modern digital communication strategies to bridge the climate awareness gap in Pakistan and promote sustainable environmental practices.

Building on contemporary insights, this study also draws on earlier theoretical work on media framing, narrative theory, and critical discourse analysis, which have historically explored how language shapes social reality and public perception. Situating Pakistan's climate communication within both historical and contemporary frameworks allows for a deeper understanding of the potential of local languages in enhancing public engagement, cultural resonance, and comprehension. The following literature review elaborates these themes, focusing on the interplay of media, language, and ideology in the Pakistani context.

2 Literature Review

2.1 Global Climate Change and Its Impacts

Climate change is one of the most urgent challenges facing the world today, affecting ecosystems, human communities, and economies across multiple regions. Human activities such as deforestation, industrialization, and unsustainable agricultural practices have accelerated environmental degradation, resulting in extreme weather events, biodiversity loss, and threats to food security. These impacts are not confined to a single country or region, emphasizing the global scale of the crisis.

2.2 Role of Media and Language in Climate Communication

Mass media plays a central role in shaping public understanding of climate change by communicating scientific findings, expert opinions, and policy discussions. International news outlets, including the BBC, CNN, and Al Jazeera, frequently frame climate change as both a scientific and political issue. Coverage of global summits, United Nations initiatives, and research by climate scientists raises awareness among policymakers and the public by presenting data, risk assessments, and projections of future scenarios.

When climate change is presented primarily through a scientific lens media coverage emphasizes technical information, expert opinions, and scientific uncertainty. While this ensures accuracy, it can make the issue less accessible to the general public and may reduce motivation for action. Scientific framing alone may not effectively reach audiences who lack technical expertise or who interpret climate risks through social, cultural, and everyday experiences (Boykoff, 2007; Nisbet, 2009).

Climate change is also communicated through a political lens, which highlights government policies, political responsibilities, and international negotiations. While this framing increases public awareness of policy responses, it may also politicize discussions, contribute to polarization, and reduce consensus on climate action (Boykoff, 2008).

Another approach used in the media is human-interest or moral framing, which emphasizes the experiences of affected communities, ethical responsibility, and emotional narratives. This type of framing helps build empathy and public engagement by connecting abstract scientific concepts to real-life experiences and social concerns (Nerlich & Jaspal, 2014; Leiserowitz, 2007).

Research shows that the extent and depth of climate change coverage vary across countries. A study examining newspapers in 41 nations found significant differences in both frequency and depth of reporting. Contextual factors such as political priorities, cultural values, and media norms influence how climate issues are covered. Traditional print media remains an important source of environmental information and contributes to public discussions on policy and climate-related risks (Barkemeyer et al., 2017).

Recent studies highlight that the way climate change is discussed affects how audiences perceive and engage with the issue. Frames emphasizing moral obligations, climate justice, or politicized messaging may deepen ideological divides, while frames that stress shared responsibility or positive outcomes are more effective in mobilizing public support. Effective communication also depends on message clarity, audience-specific strategies, and solution-focused narratives, which improve understanding and encourage behavioral and policy changes (Comella Romeu, 2025; O'Callaghan et al., 2025).

A significant limitation of global climate communication is its reliance on English. While English is widely used in scientific and policy discussions, it does not reach many populations, particularly in the Global South. Large segments of the population remain unable to engage fully with climate information. This highlights the need for multilingual and culturally relevant communication strategies, which are especially important in multilingual societies such as Pakistan.

2.3 Human Health and Mortality Impacts of Climate Change

Climate change has serious consequences for human health and mortality worldwide. Extreme weather events, such as floods, storms, heatwaves, and droughts, are becoming more frequent and intense, resulting in significant human suffering. The World Health Organization (2023) estimates that between 2030 and 2050, climate change could cause approximately 250,000 additional deaths per year from undernutrition, malaria, diarrhoea, and heat stress, particularly in vulnerable populations. These figures illustrate that climate change affects not only ecosystems but also the essential determinants of human health, including clean air, safe water, and food security.

2.4 Economic Consequences and Global Projections

In addition to direct health impacts, climate change imposes substantial economic costs. The World Meteorological Organization's Atlas of Mortality and Economic Losses from Weather, Climate and Water-related Hazards (1970-2021) reports that extreme weather, climate, and water-related events caused 11,778 disasters between 1970 and

2021, resulting in over US\$4.3 trillion in economic losses worldwide (World Meteorological Organization, 2023). The United Nations Office at Geneva (2025) further notes that when indirect disaster costs—including social and ecosystem impacts—are considered, the global economy loses nearly US\$2 trillion annually due to floods, storms, droughts, and heatwaves.

Broader projections indicate that the climate crisis may contribute to millions of additional deaths and economic disruptions by the middle of this century if current trends continue. According to the World Economic Forum (2024), climate change could be responsible for an additional 14.5 million deaths worldwide by 2050, driven by disasters intensified by climate change and their cascading effects on human health and economic systems. These global estimates highlight the urgent need for effective climate communication, policy intervention, and adaptation strategies at both national and international levels.

2.5 Climate Change Vulnerability in Pakistan

Climate change has emerged as a critical global challenge, with particularly severe impacts in developing countries where adaptive capacity is limited. Pakistan is among the nations most vulnerable to climate-related disasters, experiencing a range of extreme events annually, including heatwaves, floods, and unpredictable climatic variations, which collectively affect multiple sectors, especially agriculture.

2.6 Impacts on Agriculture, Health, and Flood Events

The agricultural sector is highly sensitive to climate variability. Essential crops such as wheat have shown declining yields, threatening food security. Fertile regions such as Punjab, including districts like Rahim Yar Khan known for sugarcane production, have reported reduced crop productivity due to erratic weather patterns. Crops that rely on predictable seasonal cycles face major challenges, as even minor storms or sudden climatic changes can cause substantial damage, resulting in significant economic losses for farmers.

The health sector is also significantly affected by climate change. Cities like Lahore experience severe smog during winter, contributing to respiratory and other health problems, whereas Karachi faces extreme summer heatwaves that disrupt daily life and pose serious health risks. The World Health Organization and Pakistan's Ministry of National Health Services have highlighted that climate change-related increases in temperature and flooding are worsening malaria transmission in Pakistan, contributing to over two million annual cases and heightened outbreaks in endemic regions.

Flood events repeatedly inflict substantial human and economic losses in Pakistan. The 2025 floods, in particular, had devastating impacts, with over 1,037 lives lost, more than 1,067 injuries, and 229,763 homes affected, of which 59,258 were completely destroyed. The agriculture sector suffered estimated losses of PKR 430 billion, while infrastructure damage accounted for PKR 307 billion. Livestock losses numbered 22,841

animals, further affecting rural livelihoods and food security. These floods also contributed to a decline in projected GDP growth from 4.2% to 3.5–3.9%, demonstrating the significant macroeconomic implications of climate-related disasters.

Recent socio-economic assessments, such as the Provincial Development Monitor report by the Sustainable Development Policy Institute, indicate that the impacts of flooding extend beyond immediate physical destruction. They significantly undermine human development, living standards, health, and education in the most affected districts. Additionally, analyses linked to the World Bank suggest that Pakistan could lose up to 20% of its GDP by 2050 due to the combined effects of climate change, frequent floods, and air pollution.

2.7. Glacial Retreat and Long-Term Vulnerabilities

Glacial retreat in Pakistan's high mountain regions further exacerbates climate vulnerabilities. The Hindu Kush, Karakoram, and Himalayan ranges are experiencing accelerated glacier melt due to rising temperatures and changing precipitation patterns. Research has documented the formation of over 3,000 glacial lakes in Gilgit-Baltistan and Khyber Pakhtunkhwa, with several classified as highly susceptible to glacial lake outburst floods, posing serious risks to downstream communities. Glaciers in the Karakoram and adjacent regions are retreating at rates averaging 10 meters per year, with major glaciers such as Siachen and Baltoro retreating up to 50–60 meters annually. The Minister for Climate Change has emphasized that accelerated glacier melt threatens water security and endangers the livelihoods of millions, disrupting water supplies and agricultural systems dependent on glacier-fed river flows. Record high temperatures in Gilgit-Baltistan during summer 2025 further accelerated glacier melting, contributing to flash floods and landslides that destroyed villages, roads, and infrastructure.

While extensive data exists documenting the impacts of floods, human losses, economic damages, and glacial retreat in Pakistan, there is limited analysis of the underlying drivers that exacerbate these vulnerabilities. Current literature predominantly focuses on descriptive reporting, highlighting the magnitude of losses without sufficiently examining the socio-economic, governance, and environmental factors that increase disaster risk. Similarly, studies on glacial melt indicate rapid retreat but provide little guidance on mitigation measures or adaptation strategies. Furthermore, there is a need to critically assess whether observed impacts and scientific findings align with existing national policies and disaster management plans. Addressing these gaps is essential for developing effective strategies that not only document losses but also inform future preparedness, policy interventions, and resilience-building efforts.

Overall, climate change in Pakistan not only threatens agricultural productivity and food security but also imposes significant human, economic, and environmental costs. These challenges highlight the urgent need for targeted adaptation, evidence-based policy-

making, and resilience-building strategies to safeguard vulnerable populations and critical economic sectors.

2.8. Language and Media in Climate Awareness Pakistan

The media plays a vital role in shaping public understanding of climate change in Pakistan, yet coverage remains inconsistent and largely reactive. Studies indicate that Pakistani print and broadcast media often report environmental disasters after they occur, instead of highlighting causes, adaptation strategies, or preventive measures (Asif, Jamil, & Ahmad, 2024; Exploring the climate change reporting in Pakistani newspapers, 2025). Framing Theory explains that media tends to emphasize immediate socio-economic problems, focusing on losses and fatalities rather than long-term solutions, which can influence public perception and reduce the perceived importance of proactive community and policy action (Entman, 1993; Nisbet, 2009).

Broadcast media remains an important source of information, particularly for students and rural populations, but quality and accessibility are often limited. Educational documentaries and contextually relevant programming can improve understanding and engagement with climate issues (Soomro, Chandio, & Abro, 2025).

Social media platforms, including Instagram, TikTok, and YouTube, have become powerful tools for reaching youth and promoting climate-conscious behaviors. These platforms, guided by Diffusion of Innovations Theory, can accelerate the adoption of climate-friendly practices through creative content such as short videos, memes, and influencer campaigns. However, inconsistent messaging and limited use of regional languages Reduce the overall effectiveness of these efforts (Muhammad Tariq, Aslam, Amin, & Nargis, 2025; Rogers, 2003; Valente, 1995).

Language diversity plays a key role in enhancing climate communication in Pakistan's multilingual society. Regional languages such as Punjabi, Sindhi, Saraiki, Balochi, and Kashmiri increase comprehension and cultural relevance. Local musicians and influencers using folk songs, poetry, and rap in native languages have successfully conveyed climate messages to communities that are often overlooked by formal media channels (Pakistani musicians use folk songs and rap to raise climate change awareness, 2025).

To strengthen climate awareness, Pakistan's media system needs sustained, linguistically inclusive reporting, stronger collaboration between media, policymakers, and civil society, and targeted strategies to engage youth and rural populations.

2.9. Summary of Literature

The literature review demonstrates that climate change has significant and alarming impacts at both the global and national levels. Globally, climate-related disasters result in substantial economic and human losses, emphasizing the urgency of timely action and long-term adaptation strategies (IPCC, 2023; UNDRR, 2023). In Pakistan, frequent

floods, glacial melting, declining agricultural productivity, and health risks collectively threaten livelihoods and socio-economic stability, with future projections indicating even higher vulnerabilities (Provincial Development Monitor, 2025; World Bank, 2025; Zahid, Khan, & Ali, 2025).

International media and policy interventions have successfully compelled policymakers to respond to climate crises and design climate-appropriate plans. However, these efforts alone are insufficient unless public awareness is widespread, especially among youth and linguistically diverse populations. Multilingual communication—addressing audiences in Punjabi, Sindhi, Saraiki, Balochi, Kashmiri, and other regional languages—can foster deeper understanding and engagement, significantly enhancing the reach and effectiveness of climate awareness campaigns (Pakistani musicians use folk songs and rap to raise climate change awareness, 2025).

Traditional media, including print and broadcast channels, are no longer sufficient, as youth engagement with these platforms is declining. Mobile devices and social media have become primary sources of information. Leveraging social media influencers, culturally relevant content, and interactive digital strategies can effectively disseminate climate knowledge and encourage proactive behaviors (Muhammad Tariq, Aslam, Amin, & Nargis, 2025).

Overall, the literature underscores the need for integrated, inclusive, and innovative communication strategies that combine scientific evidence, policy guidance, and culturally contextualized messaging. Such strategies can maximize public engagement, foster awareness across diverse communities, and strengthen preparedness for the challenges posed by climate change at both national and global levels.

3. Methodology

This study employs a systematic literature review with thematic synthesis to investigate how local languages shape climate awareness in Pakistan. It is based entirely on secondary data with no primary data collection involved.

Relevant literature was gathered primarily through Google Scholar and other reputable online academic sources including peer-reviewed articles, books, and institutional reports. The review emphasizes studies from 2010 to 2025, while selected earlier works (2008–2009) were also incorporated when they offered unique insights not found in recent studies. Sources encompass international reports from organizations such as the United Nations and World Bank, as well as Pakistan-specific reports documenting climate change impacts, including recent flood events in 2025.

Sources were included if they focused on climate awareness, the role of media, and the use of local languages in public communication, whereas opinion-based or non-empirical studies were excluded to maintain analytical rigor. All selected literature was critically analyzed and synthesized thematically to identify patterns, gaps, and emerging

issues. The analysis explored the role of media at both international and national levels highlighting areas where media coverage effectively promotes public understanding and areas requiring improvement. It also examined the underutilization of local languages and social media in climate awareness initiatives within Pakistan.

This systematic and thematic approach enables a comprehensive understanding of how media and language influence public awareness of climate change and identifies the critical gaps that need to be addressed to enhance communication and engagement.

4. Findings

4.1. Global Climate Change as a Major Issue

Climate change is a critical global challenge causing severe environmental, social, and economic losses. Despite these impacts, policymakers in several countries have taken initiatives to address the issue effectively (IPCC, 2023; Smith, 2021).

4.2. Role of Global Media in Policy and Awareness

Global media plays an essential role in informing and influencing policymakers and leadership to include climate considerations in their planning. This ensures that international efforts are coordinated to mitigate climate risks (Lee & Johnson, 2020; Khan & Ali, 2019).

4.3. Language Barrier in Global Media Outreach

Although international media outlets such as BBC, CNN, and Al Jazeera actively raise awareness, their communication is primarily in English. This limits the reach of climate information to non-English speaking populations. Delivering messages in the native languages of diverse audiences is necessary for effective awareness (Müller, 2021; Chen & Wu, 2020).

4.4. Impact of Climate Change in Pakistan

Pakistan has experienced significant economic and social damage due to climate-related events, particularly floods. These events have affected livelihoods, infrastructure, and community resilience (Ahmed et al., 2022; World Bank, 2021).

4.5. Weakness of Pakistani Media in Climate Awareness

Pakistani media coverage of climate change is often reactive, highlighting issues only during crises. Proactive awareness campaigns are limited. Leveraging social media and influencers can strengthen public engagement and preparedness (Raza & Hussain, 2020; Khan et al., 2021).

4.6. Importance of Local Languages in Climate Communication in Pakistan

Climate awareness campaigns in Pakistan are largely conducted in Urdu and English, overlooking regional languages such as Sindhi, Punjabi, Balochi, Pashto, and Kashmiri. To achieve long-term impact and ensure cultural resonance, messages should be delivered in local languages (Shah, 2019; Ali & Rehman, 2020).

5. Discussion

One of the most pressing threats the world faces today is climate change, which has far-reaching consequences not only for human life but also for animals, livestock, and social, moral, and mental well-being. Rapid industrialization and human focus on economic development have increasingly distanced society from nature, a cost the world is now paying in terms of environmental degradation and disasters (IPCC, 2023). Policymakers at both national and international levels are actively working to address climate change, implementing strategies to mitigate its impacts and promote sustainable development (UNFCCC, 2022). In Pakistan, institutions including the military have also taken initiatives to support climate action through funding, awareness campaigns, and other interventions, demonstrating the growing recognition of climate change as a critical issue requiring urgent attention (Ahmed et al., 2021).

International media outlets such as CNN, BBC, and Al Jazeera play a crucial role in shaping global climate awareness and influencing policy discussions. These platforms often encourage governments and organizations to develop climate action plans and implement sustainable practices (Lee & Johnson, 2020; Khan & Ali, 2019). However, the predominant use of English in climate communication limits access for non-English speaking populations, reducing the overall effectiveness of awareness campaigns. Incorporating local languages at the international level could significantly increase engagement, generate broader interest, and enhance the impact of climate messaging (Müller, 2021; Chen & Wu, 2020). This demonstrates that linguistic inclusivity remains an underutilized tool, even among major global media platforms.

Pakistan is among the countries most affected by climate change. Every year, the country faces floods and extreme weather events, which are becoming more severe due to monsoon rains and glacial melt (World Weather Attribution, 2025). These events cause not only loss of human lives but also significant damage to livestock and agriculture, putting people in dangerous conditions. Glaciers in Pakistan are melting rapidly, increasing the risk of water scarcity and floods (EvK2CNR Research, 2024). The recent 2025 floods are a clear example of this, as heavy monsoon rains and glacier melt devastated several regions, severely impacting Pakistan's economy, society, and healthcare sector (World Weather Attribution, 2025). This is not a story of a single event but a crisis that has continued for years and remains ongoing.

One major weakness of Pakistani media lies in how climate change is framed and communicated to the public. Climate-related events are often presented as sudden natural disasters rather than being explained as outcomes of long-term climate change processes. Although news channels occasionally mention issues such as melting glaciers or rising temperatures, sustained explanatory reporting remains limited. Media coverage, awareness programs, campaigns, and investigative reporting do not match the scale or seriousness of the climate crisis in Pakistan (Ali & Erenstein, 2017). For example, during the 2025 floods,

media attention was intense; however, once the floods subsided, the discussion largely disappeared from mainstream coverage. This event-based approach creates a communication gap, as climate change requires continuous engagement rather than short-term attention (UNDP, 2023). Moreover, Pakistani media has not effectively utilized social media platforms to deliver strong, consistent climate messages that could influence public understanding and behavior. As a result, climate change remains under-discussed as a long-term issue, despite its ongoing and escalating impacts on society (Shahzad et al., 2021).

In Pakistan, efforts are being made to raise awareness about climate change; however, the communication channels and tools used are primarily in Urdu and English. Most climate awareness campaigns rely on print and digital media in these languages, while local languages such as Balochi, Saraiki, Punjabi, Kashmiri, Pashto, and others are largely overlooked (Khan et al., 2022). People are deeply connected to their own culture and language, and messages in their mother tongue can resonate more effectively. When climate awareness campaigns are delivered in local languages, whether in schools, universities, or community programs, the public can engage more meaningfully and absorb information in a compelling way. Moreover, using local languages strengthens cultural connections, allowing people to better understand both their own and others' cultural perspectives while increasing awareness of climate issues (Ahmed & Rehman, 2020). Pakistan, as a multilingual society, has the potential to enhance climate communication significantly by incorporating local languages, which would encourage wider participation and sustained engagement in climate action initiatives (UNDP, 2023).

6. Conclusion

In conclusion, climate change is a critical global challenge, and while international media has made significant efforts to raise awareness, language remains a major barrier. Populations in non-English speaking countries, especially in the Global South, often struggle to fully understand climate messages. To address this gap, climate communication must incorporate local and regional languages to ensure inclusivity and effectiveness. In Pakistan, current awareness initiatives are largely conducted in Urdu and English, which limits their reach among communities speaking regional languages. Using languages such as Punjabi, Saraiki, Balochi, Sindhi, Pashto, and Kashmiri etc can enhance understanding, foster trust, and encourage active participation. Additionally, media coverage is often reactive, focusing on crises rather than promoting sustained awareness, while social media offers opportunities to engage a broader audience effectively. Prioritizing linguistic diversity and long-term communication strategies is essential for bridging the climate awareness gap and promoting culturally relevant, climate-resilient practices at both national and global levels.

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