INDONESIAN JOURNAL OF SOCIAL AND ENVIRONMENTAL ISSUES (IJSEI)
Journal Homepage: https://ojs.literacyinstitute.org/index.php/ijsei
ISSN: 2722-1369 (Online)
Review Article

Volume 6	Issue 3	December (2025)	DOI: 10.47540/ijsei.v6i3.2344	Page: 318 – 333

Digital Environmentalism: The Role of Social Media in Shaping Climate Awareness and Action

Deepak Kumar Saini[1], Arzoo Rana[2]
[1]Department of Botany & Microbiology, Govt. KRG PG College, India
[2]Sociology, Maharaja Chhatrasal Bundelkhand University (MCBU), India
Corresponding Author: Deepak Kumar Saini; Email: deepakkumar.saini@mp.gov.in

ARTICLE INFO

Keywords: Climate Change; Digital Environmentalism; Environmental Activism; Social Media.

Received : 20 October 2025
Revised : 25 December 2025
Accepted : 30 December 2025

ABSTRACT

Climate change represents one of the most pressing challenges facing humanity in the 21st century. This review examines the multifaceted role of social media in contemporary environmental movements, exploring how digital platforms have transformed climate communication, analyzing the effectiveness of digital campaigns, and addressing the challenges and limitations of online environmental activism. Through a comprehensive synthesis of recent scholarship on digital environmentalism, this article provides insights into both the potential and pitfalls of social media as a tool for climate action. The findings reveal that social media serves as a powerful tool for raising climate awareness and mobilizing action when used strategically, while also facing significant limitations, including misinformation, the digital divide, and platform dependency. The review concludes that hybrid approaches combining digital and traditional organizing methods, alongside intentional efforts to bridge accessibility gaps and advance environmental justice, represent the most promising path forward for effective climate action.

INTRODUCTION

Climate change represents one of the most pressing challenges facing humanity in the 21st century. As scientific consensus strengthens regarding anthropogenic climate impacts, the need for widespread public awareness and coordinated action has never been more urgent (IPCC, 2021). Traditional environmental movements, while effective in raising awareness among certain demographics, have often struggled to reach younger generations and diverse populations through conventional media channels (Anderson, 2014). The emergence of social media platforms has fundamentally altered this landscape, creating new opportunities for climate communication and environmental activism.

Social media platforms such as Facebook, Twitter, Instagram, TikTok, and YouTube have become central spaces for climate discourse, enabling unprecedented levels of public engagement with environmental issues (Pearce et al., 2019; Sultana et al., 2024). These platforms allow for rapid information dissemination, facilitate global connections between activists, and provide tools for organizing collective action. The decentralized nature of social media has democratized environmental communication, allowing ordinary citizens to participate in climate conversations that were previously dominated by scientists, policymakers, and traditional media outlets (Hackett et al., 2017).

The concept of digital environmentalism describes how people use digital technologies to support environmental goals, with social media playing a central role. Platforms such as Instagram, X (formerly Twitter), and YouTube help spread clear information about climate change, pollution, and biodiversity loss, while also mobilizing public support through online campaigns, petitions, and fundraising. These tools enable rapid coordination of real-world action, including protests, cleanups, and policy advocacy, and they amplify the voices of scientists, activists, and affected communities. (Neumayer & Svensson, 2016). This phenomenon extends beyond simple information sharing to include complex networks of engagement, from

hashtag campaigns and viral videos to online petitions and virtual protests. Understanding how social media shapes climate awareness and drives environmental action is crucial for developing effective communication strategies and mobilizing the collective response needed to address climate change.

This review article examines the multifaceted role of social media in contemporary environmental movements with the following specific objectives: (1) To analyze how social media platforms have transformed environmental communication and climate discourse, (2) To evaluate the mechanisms through which social media influences climate awareness and mobilizes environmental action, (3) To assess the effectiveness of digital campaigns, youth movements, and influencer-led climate communication, (4) To identify the challenges and limitations of digital environmentalism, including misinformation, the digital divide, and platform dependency, (5) To explore future directions and recommendations for effective, inclusive digital environmental activism.

MATERIALS AND METHODS

Review Design

This study employs a comprehensive literature review methodology to synthesize current knowledge on the role of social media in climate awareness and environmental action. The review adopts a narrative synthesis approach, allowing for the integration of diverse research perspectives, methodologies, and findings across the field of digital environmentalism.

Literature Search Strategy

A systematic search of academic databases was conducted to identify relevant literature published primarily between 2010 and 2025, covering the period of significant social media growth and environmental activism. Key databases searched included Web of Science, Scopus, Google Scholar, and specialized environmental communication journals. Search terms included combinations of: “social media”, “environmental activism”, “digital environmentalism”, “climate change”, “climate communication”, “online mobilization”, and platform-specific terms (Twitter, Facebook, Instagram, TikTok, YouTube).

Inclusion and Exclusion Criteria

Literature was included if it: (1) focused on social media's role in environmental or climate-related communication and activism; (2) was published in peer-reviewed journals, books, or reputable conference proceedings; (3) provided empirical data, theoretical frameworks, or substantive analysis; and (4) was available in English. Studies were excluded if they focused solely on traditional media without addressing digital platforms or lacked substantive discussion of environmental themes.

Data Extraction and Analysis

From the selected literature, key information was extracted, including: theoretical frameworks employed, methodological approaches, main findings, platform-specific insights, geographic contexts, and identified challenges or limitations. The extracted data was organized thematically to address the research objectives, allowing for identification of patterns, consensus areas, and gaps in current knowledge.

Thematic Organization

The review organizes findings into thematic categories reflecting major areas of scholarship: the evolution of environmental communication, mechanisms of social media influence, youth movements and digital activism, influencer roles, digital campaigns and mobilization, misinformation challenges, the relationship between online and offline action, platform-specific dynamics, artificial intelligence impacts, geographic and cultural dimensions, equity and justice concerns, organizational adaptation, corporate responses, and future directions.

Limitations of the Review Methodology

This narrative review, while comprehensive, is subject to certain limitations. The rapidly evolving nature of social media means some recent platform developments may not yet be reflected in peer-reviewed literature. The predominance of English language scholarship may underrepresent non-Western perspectives on digital environmentalism. Additionally, the selective nature of narrative synthesis means the review reflects interpretive choices about emphasis and organization of the literature.

RESULTS AND DISCUSSION

Environmental Communication across Digital Platforms

Environmental communication has undergone a dramatic transformation over the past two decades. Traditional environmental movements relied heavily on print media, television documentaries, and face-to-face organizing to build awareness and mobilize action (Cox, 2013). These methods, while effective, were often limited by geographic boundaries, resource constraints, and gatekeeping by media organizations. The advent of Web 2.0 technologies and social media platforms has fundamentally disrupted these traditional communication models.

The shift toward digital platforms began in earnest in the mid-2000s, as environmental organizations recognized the potential of online spaces to reach new audiences (Pickerill, 2003). Early adopters used websites and email lists to coordinate campaigns and share information. However, the true transformation occurred with the rise of social media platforms that emphasized user-generated content and networked communication (Castells, 2015). These platforms enabled environmental advocates to bypass traditional media gatekeepers and communicate directly with global audiences.

Social media's visual nature has proven particularly effective for environmental communication. Platforms like Instagram and TikTok allow activists to share compelling imagery and short videos that convey the urgency and emotional weight of climate issues (Hautea et al., 2021). Images of melting glaciers, extreme weather events, and endangered species can circulate rapidly, creating emotional connections that motivate action. This visual storytelling has become a cornerstone of digital environmental campaigns.

The participatory nature of social media has also transformed the relationship between environmental organizations and their supporters. Rather than passive recipients of information, social media users become active participants in environmental discourse, sharing content, adding their voices, and creating their own climate-related media (Jenkins et al., 2016). This participatory culture has expanded the diversity of perspectives within environmental movements and enabled more inclusive conversations about climate solutions.

Recent scholarship emphasizes that digital environmentalism creates a distinct media ecology where communication practices and their environmental footprints must be considered together (Bussoletti et al., 2025). This perspective recognizes that digital platforms are not merely neutral channels for environmental messaging but actively shape how environmental issues are understood and addressed. The material infrastructure of digital communication itself carries environmental implications that complicate straightforward narratives about technology's role in climate action.

Mechanisms of Social Media Influence on Climate Awareness

Social media influences climate awareness through several interconnected mechanisms. Understanding these pathways is essential for evaluating the effectiveness of digital environmentalism. The first mechanism involves information diffusion through social networks. When users share climate-related content, it spreads through their personal networks, reaching individuals who might not actively seek environmental information (Williams et al., 2015). This organic spread can expose large audiences to climate messages in contexts that feel personal and trustworthy.

Algorithmic amplification represents another crucial mechanism. Social media platforms use algorithms to determine what content users see in their feeds. Content that generates high engagement through likes, shares, and comments receives greater visibility (Bucher, 2012). Climate content that resonates emotionally or presents information in engaging formats can therefore achieve viral reach, exposing millions to environmental messages. However, these same algorithms can also create filter bubbles that limit exposure to diverse perspectives.

Social proof plays a significant role in shaping climate awareness through social media. When users observe their peers engaging with environmental content, they perceive climate action as socially normative (Goldstein et al., 2008). This normalization effect can shift attitudes and behaviors by making environmental concern appear mainstream rather than fringe. Seeing friends and influencers prioritize climate issues signals that such concern is valued within one's social group.

Emotional engagement represents a particularly powerful mechanism. Social media excels at generating emotional responses through visual content, personal narratives, and interactive features (Papacharissi, 2015). Climate content that evokes emotions such as hope, anger, or concern tends to be more memorable and motivating than purely factual information (Sanford et al., 2023). Youth-led movements have been particularly adept at leveraging emotional storytelling to build climate awareness and solidarity. Research demonstrates that emotional framing in online environmental activism can significantly impact both online engagement and offline behavioral intentions, with different emotions producing distinct patterns of mobilization.

The immediacy of social media also enables real-time climate communication. During extreme weather events or climate-related disasters, social media provides up-to-the-minute information and first-hand accounts (Veil et al., 2011; Liu et al., 2024). This immediacy can heighten awareness of climate impacts and create windows of opportunity for climate communication. The visual documentation of climate events on social media makes abstract threats feel concrete and urgent, as evidenced by the rapid public response to recent wildfires and other climate disasters streamed live on platforms like TikTok.

Youth Movements and Digital Climate Activism

Youth-led climate movements have emerged as a defining feature of contemporary environmental activism, with social media serving as their primary organizing platform. The Fridays for Future movement, initiated by Greta Thunberg in 2018, exemplifies how social media enables young activists to mobilize globally (De Moor et al., 2020). What began as a solo protest outside the Swedish parliament rapidly expanded into a worldwide movement coordinating millions of young people through digital platforms.

Social media has proven particularly effective for youth climate activism because it aligns with young people's communication preferences and technological fluency. Platforms like Instagram, TikTok, and Twitter allow youth activists to create and share content in formats that resonate with their peers (Boulianne et al., 2020). Short videos, memes, and visual infographics make complex climate science accessible and engaging for younger audiences. This accessibility has helped democratize climate knowledge and empowered young people to become climate communicators.

The hashtag has emerged as a crucial organizing tool for youth climate movements. Campaigns like #FridaysForFuture, #ClimateStrike, and #YouthForClimate serve as digital rallying points that coordinate action across geographic boundaries (Boulianne et al., 2020). Hashtags create visible markers of collective identity and enable participants to see themselves as part of a larger movement. They also facilitate media coverage by aggregating diverse actions under a unified banner.

Youth activists have demonstrated sophistication in using multiple platforms strategically. Instagram serves as a space for visual storytelling and community building, with activists personalizing climate change through carefully curated visual narratives that make sustainability mainstream (Buhre, 2024; San Cornelio et al., 2024). Twitter enables rapid response and dialogue with policymakers, and TikTok reaches younger demographics through creative short-form content (Hautea et al., 2021). This multi-platform approach maximizes reach and allows movements to engage different audiences with tailored messaging.

The global nature of youth climate movements, facilitated by social media, has challenged traditional power dynamics within environmentalism. Young activists from diverse geographic and cultural backgrounds can connect directly, sharing strategies and building solidarity without requiring institutional intermediaries (Fisher, 2019, 2024). This horizontal organizing structure reflects social media's networked architecture and enables more inclusive and representative climate movements. Recent research on FridaysForFuture-Rome and other local chapters demonstrates how youth activists effectively combine online coordination with offline presence, creating hybrid forms of activism that leverage digital tools while maintaining strong community ties (Belotti et al., 2022).

Influencers, Celebrities, and Climate Communication

The role of influencers and celebrities in climate communication represents a significant dimension of digital environmentalism. Social media influencers possess the ability to reach large, engaged audiences and shape public opinion on

environmental issues (De Veirman et al., 2017). When influencers incorporate climate messaging into their content, they introduce environmental concerns to audiences who may not otherwise engage with such topics.

Celebrity climate advocacy has expanded dramatically on social media platforms. Celebrities like Leonardo DiCaprio, Emma Watson, and Billie Eilish use their massive followings to amplify climate messages and environmental campaigns (Anderson, 2013). Their posts can generate millions of engagements and drive significant media attention to climate issues. The parasocial relationships that followers feel with celebrities can make climate messages feel more personal and relatable. The systematic review of Greta Thunberg's impact demonstrates the profound "Greta effect" on digital climate change communication, showing how a single influential figure can reshape global environmental discourse (Mede & Schroeder, 2024).

However, celebrity and influencer climate communication faces legitimate criticism. Concerns about authenticity arise when wealthy celebrities advocate for climate action while maintaining carbon-intensive lifestyles (Anderson, 2013). This perceived hypocrisy can undermine climate messages and fuel cynicism. Social media users frequently call out inconsistencies between celebrities' climate rhetoric and their actual behavior, highlighting the platform's role in accountability.

Micro-influencers and niche environmental content creators often prove more effective than mega-celebrities for certain audiences. These smaller-scale influencers typically have more engaged communities and perceived authenticity (De Veirman et al., 2017). Sustainability influencers who consistently demonstrate environmental commitment through their lifestyle choices can inspire followers to adopt similar practices. Their more modest follower counts are offset by higher levels of trust and engagement.

The rise of "eco-influencers" or "greenfluencers" represents a distinct category of digital environmental advocacy. These content creators focus specifically on sustainable living, zero-waste practices, and climate education (Gannon and Prothero, 2018). They provide practical guidance that makes environmental action feel achievable rather than overwhelming. By documenting their own journeys toward sustainability, they model behavior change and build communities around shared environmental values.

Recent research demonstrates that following environmental influencers and developing parasocial relationships with them significantly impacts youth participation in climate action (Dekoninck & Schmuck, 2024). Greenfluencers who share nature experiences through virtual nature posts can effectively drive climate action by creating emotional connections to natural environments (Dekoninck et al., 2025). However, the effectiveness of this "greenfluence" depends on authenticity, with audiences responding more positively to influencers who demonstrate genuine commitment rather than performative environmentalism (Knupfer et al., 2023).

Environmental influencers on TikTok have developed particularly engaging approaches, using emotional labor and storytelling as counter-narratives to climate doom (Haastrup, 2023). By making climate action fun rather than frightening, these creators reach audiences who might otherwise disengage from overwhelming climate content. This strategic use of positive framing and entertaining content represents an evolution in digital environmental communication.

Digital Campaigns and Online Mobilization

Social media has enabled environmental organizations to launch digital campaigns with unprecedented reach and impact. Online petitions on platforms like Change.org and Avaaz have mobilized millions around specific environmental issues, from protecting endangered species to demanding climate policy action (Halupka, 2018). While the effectiveness of online petitions remains debated, they serve important functions in raising awareness and demonstrating public support for environmental causes.

Hashtag campaigns represent another prominent form of digital environmental mobilization. Campaigns like #SaveTheArctic, #ActOnClimate, and #EarthHourBlue create focal points for coordinated action and conversation (Yang, 2016). Successful hashtag campaigns generate media attention, pressure decision-makers, and build community among participants. The visibility of hashtag campaigns on social media

platforms makes environmental issues trend and enter mainstream consciousness.

Virtual protests and digital strikes have emerged as new forms of climate action, particularly suited to social media platforms. When the COVID-19 pandemic limited in-person gatherings, climate activists shifted to digital protests that maintained momentum while adhering to public health guidelines (Boulianne et al., 2020). These virtual actions demonstrated that online mobilization could sustain movements even without traditional street protests.

Social media crowdfunding has provided environmental organizations and activists with new funding mechanisms. Platforms like GoFundMe and Patreon enable supporters to directly fund environmental projects and activist work (Josefy et al., 2017). This disintermediation reduces reliance on traditional grant-making institutions and allows grassroots initiatives to access resources. Successful campaigns often leverage compelling narratives and visual content to inspire donations.

The speed of digital mobilization represents a distinct advantage of social media activism. Environmental campaigns can respond rapidly to emerging threats or policy opportunities, mobilizing supporters within hours rather than weeks (Earl and Kimport, 2011). This agility allows movements to capitalize on news cycles and maintain pressure on decision-makers. The 2019 Amazon fires, for example, sparked immediate global outcry and mobilization through social media platforms.

Research on climate change advocacy and engagement demonstrates that social media users employ diverse strategies to promote environmental action, from sharing scientific information to personal narratives and calls for political action (Hart et al., 2024). Global environmental NGOs strategically frame climate change on Facebook using multiple approaches, including responsibility attribution, action mobilization, and solutions framing, to engage different audiences and drive participation (Vu et al., 2021). The most effective campaigns combine multiple framing strategies and provide clear pathways for meaningful engagement.

Climate Misinformation and Counter-Narratives

While social media amplifies climate awareness, it also facilitates the spread of climate misinformation and denial. The same mechanisms that allow accurate climate information to go viral also enable false or misleading content to reach large audiences (van der Linden et al., 2017). Climate skeptics and denial organizations have effectively used social media to sow doubt about climate science and delay policy action.

The algorithmic nature of social media platforms can amplify misinformation by prioritizing engaging content regardless of accuracy. Emotionally charged false claims often generate more engagement than nuanced scientific explanations, giving them algorithmic advantages (Vosoughi et al., 2018). This creates challenges for effective climate communication and can undermine public understanding of climate science.

Echo chambers and filter bubbles on social media can reinforce existing beliefs about climate change rather than exposing users to diverse perspectives. Algorithms show users content similar to what they have previously engaged with, potentially creating information environments that confirm rather than challenge views (Sunstein, 2017). Climate skeptics may therefore be primarily exposed to content that reinforces denial, while climate activists encounter primarily pro-climate content.

Efforts to combat climate misinformation on social media have taken multiple forms. Fact-checking organizations partner with platforms to identify and flag false climate claims (Graves, 2018). Some platforms have implemented policies to reduce the reach of climate misinformation or add context to disputed claims. However, these efforts face challenges around defining misinformation and avoiding perceptions of censorship.

Environmental activists and organizations have developed strategies to counter climate misinformation through proactive communication. These include prebunking strategies that inoculate audiences against common misinformation tactics and techniques for making climate science more engaging and shareable (van der Linden et al., 2017). Scientists increasingly use social media to communicate directly with the public, providing authoritative information that can counter false narratives.

Emerging research demonstrates that correcting climate change misinformation on social media involves complex reciprocal relationships between correcting others, anger, and

environmental activism (Weidlich & Kropp, 2023). Individuals who actively correct misinformation tend to experience increased anger about climate issues, which paradoxically can fuel both continued correction efforts and broader environmental activism. This suggests that combating misinformation may serve as an entry point to deeper climate engagement, though the emotional toll requires consideration.

The systematic review of climate change and social media research reveals that misinformation remains one of the most persistent challenges facing digital environmentalism (Sultana et al., 2024). Current trends indicate that misinformation will continue evolving in sophistication, particularly with the emergence of AI-generated false content, requiring ongoing adaptation of counter-strategies.

From Online Engagement to Offline Action

A central question in evaluating digital environmentalism concerns whether online engagement translates into meaningful offline action. Critics argue that social media activism often amounts to "slacktivism" or "clicktivism" that substitutes low-cost digital actions for substantive behavioral or political change (Kristofferson et al., 2014). Liking a climate post or signing an online petition requires minimal effort and may provide participants with a sense of accomplishment that paradoxically reduces motivation for more demanding actions.

However, research suggests a more nuanced relationship between online and offline environmental action. Social media engagement can serve as an entry point that introduces individuals to environmental issues and movements, potentially leading to deeper involvement over time (Boulianne, 2015). Online spaces allow people to learn about environmental problems, discover local organizations, and find opportunities for concrete action. The Fridays for Future movement demonstrated how digital organizing can successfully mobilize millions for in-person protests.

Social media's role in coordinating offline action represents one of its clearest contributions to environmental movements. Platforms excel at logistical coordination, allowing organizers to communicate event details, share resources, and mobilize participants for physical protests, clean-up events, and other offline activities (Earl & Kimport, 2011). The 2019 Global Climate Strikes, which brought millions to the streets worldwide, were organized primarily through social media coordination.

Building on online engagement requires intentional strategies that create pathways from digital participation to offline action. Environmental organizations increasingly design campaigns that incorporate both online and offline elements, using social media to recruit participants for in-person events or behavioral change initiatives (Fung et al., 2016). Effective campaigns provide multiple levels of engagement, allowing individuals to deepen their involvement progressively.

The relationship between online discourse and policy outcomes represents another dimension of social media's impact. Digital campaigns can generate political pressure that influences decision-makers, particularly when online mobilization is accompanied by traditional advocacy efforts (Halupka, 2018). Social media makes officials more visible and accountable to constituents, creating opportunities for direct engagement and public pressure campaigns.

Research pairing Twitter studies with offline experiments demonstrates that emotional framing in online environmental activism significantly affects both digital engagement and subsequent prosocial action (Sanford et al., 2023). Messages that effectively combine emotional appeal with clear action pathways are most successful at translating online attention into offline behavioral change. This suggests that the quality and design of digital content matter substantially for achieving tangible environmental outcomes.

Social Media Platforms and Environmental Discourse

Different social media platforms shape environmental discourse in distinct ways based on their technological affordances and user cultures. Twitter's real-time, text-based format facilitates rapid response to climate news and enables direct engagement with journalists and policymakers (Kirilenko & Stepchenkova, 2014). The platform has become central to climate communication among scientists, activists, and media professionals, though its character limits can encourage oversimplification.

Instagram's visual focus makes it particularly effective for emotional climate storytelling and

lifestyle-oriented environmental content. The platform excels at showcasing sustainable living practices, nature photography, and visual documentation of environmental degradation (Hautea et al., 2021). Instagram influencers have built large followings around eco-conscious lifestyles, translating environmental values into aesthetic choices and consumer behaviors. Recent studies demonstrate that activists from Fridays for Future strategically visualize climate action on Instagram through personal, authentic content that humanizes the climate crisis (Buhre, 2024). Emerging visual narratives on Instagram position sustainability as desirable and mainstream rather than marginal or sacrificial (San Cornelio et al., 2024).

TikTok has emerged as a crucial platform for reaching younger audiences with climate content. The platform's algorithm can propel content to viral status regardless of the creator's existing follower count, democratizing reach in ways that older platforms do not (Hautea et al., 2021). Climate creators on TikTok use humor, music, and creative editing to make environmental messages entertaining and shareable. The platform's format encourages participatory trends where users create their own versions of popular climate content.

Content analysis of climate change videos on TikTok reveals diverse approaches to environmental communication, from scientific education to emotional storytelling and political commentary (Basch et al., 2022). During major climate summits, TikTok discourse evolves from discussing environmental issues to increasingly politicized content, reflecting the platform's role in shaping public perception of climate negotiations (Nieto-Sandoval & Ferré-Pavia, 2024). TikTok's potential as a learning analytics tool allows researchers to track how climate change framing and data practices evolve in real-time (Nguyen, 2023).

Research in contexts like Nigeria demonstrates TikTok's effectiveness in promoting public awareness and engagement on climate change adaptation and mitigation measures, particularly among younger demographics (Nwafor et al., 2024). The platform's ability to stream disasters in real-time, as seen during the 2023 Maui Wildfire, creates unique opportunities for social-mediated crisis communication while raising important questions about public engagement and emotional responses during climate emergencies (Liu et al., 2024).

Facebook's group functionality supports community-building around environmental issues, enabling sustained engagement beyond individual posts. Environmental groups on Facebook create spaces for discussion, resource sharing, and local organizing (Pearce et al., 2019). The platform's older user demographic compared to TikTok or Instagram means it reaches different audiences, including decision-makers and older activists.

YouTube serves as a repository for longer-form environmental content, including documentaries, educational videos, and in-depth explorations of climate solutions. Environmental channels on YouTube can build loyal audiences and provide comprehensive climate education that shorter-form platforms cannot accommodate (Rooney et al., 2017). The platform's search functionality also makes it valuable for individuals actively seeking environmental information.

Artificial Intelligence and Climate Communication

The emergence of generative artificial intelligence represents a transformative development for digital environmentalism. Large language models and AI-powered tools are reshaping how climate information is produced, disseminated, and consumed on social media platforms (Schäfer, 2025). Generative AI offers capabilities for composing engaging multimodal posts, delivering personalized information, and engaging in dialogue with users, potentially enhancing climate communication effectiveness.

However, researchers have raised substantial concerns about AI's indirect impacts on climate action. Van der Ven et al. (2024) argue that generative AI and social media may exacerbate the climate crisis by undermining the attention, optimism, creativity, and accuracy needed to address environmental challenges. The volume of AI-generated content could overwhelm users with information of varying quality, making it more difficult to assess source credibility (Schäfer, 2025). Additionally, emotionally charged AI-generated images and text can amplify climate misinformation, as evidenced by false information spread during recent extreme weather events.

The integration of AI into social media ecosystems creates new challenges for environmental communication. AI-powered recommendation systems may prioritize engagement over accuracy, potentially amplifying sensationalist or misleading climate content. Deepfakes and synthetic media can be weaponized to discredit climate scientists or fabricate environmental disasters, eroding public trust in legitimate climate information. The ease of generating persuasive but false content with AI tools lowers barriers to sophisticated disinformation campaigns.

Despite these concerns, AI also presents significant opportunities for climate communication. Deep learning approaches enable large-scale monitoring of public perceptions and emotions regarding climate change on social media (Rocha-Gomes et al., 2025). Natural language processing can identify specific climate phenomena in user discourse and track sentiment patterns across different regions and languages. These analytical capabilities allow researchers and activists to understand public opinion dynamics and tailor communication strategies more effectively.

Understanding how AI shapes climate emotions on digital platforms has become crucial, as collective climate emotions increasingly drive both individual and collective climate action (Brosch, 2025). AI tools can identify patterns in how people express anxiety, hope, anger, and other emotions related to climate change across social networks. This emotional intelligence could inform more empathetic and effective climate communication that acknowledges psychological dimensions of climate engagement.

AI-powered chatbots and virtual assistants offer potential for personalized climate education, answering individual questions and providing customized recommendations for sustainable behaviors. These tools could democratize access to climate information, making expert knowledge available to broader audiences. However, ensuring accuracy, avoiding algorithmic bias, and maintaining transparency in AI-driven climate communication remain critical challenges.

The integration of AI into climate communication requires careful consideration of both benefits and risks. While AI tools may enhance information accessibility and engagement, they also necessitate stronger media literacy, transparent algorithmic design, and mechanisms to ensure accuracy and prevent the amplification of misinformation (Schäfer, 2025). As AI becomes increasingly central to social media ecosystems, its role in environmental activism will require ongoing research and thoughtful governance.

Geographic and Cultural Dimensions of Digital Environmentalism

Digital environmentalism manifests differently across geographic and cultural contexts. While social media enables global connections, environmental movements remain shaped by local contexts, priorities, and constraints (Neumayer and Svensson, 2016). Understanding these variations is crucial for developing culturally appropriate climate communication strategies and avoiding Western-centric assumptions about digital activism.

In the Global South, digital environmental movements face distinct challenges and opportunities. Limited internet access and digital literacy create barriers to participation, potentially excluding marginalized communities from digital climate conversations (Sein and Harindranath, 2004). However, mobile technology penetration has enabled environmental organizing in regions with limited desktop internet access. SMS-based organizing and mobile-optimized platforms have proven effective in contexts where smartphones are more accessible than computers.

Cultural contexts shape how environmental messages resonate on social media. Climate communication that works in one cultural context may fail in another due to different values, communication styles, or environmental priorities (Ballantyne, 2016). Environmental movements increasingly recognize the need for culturally specific messaging that connects climate change to local concerns and draws on culturally relevant narratives and symbols.

Indigenous communities have leveraged social media to amplify their environmental advocacy and defend their territories against extractive industries. Platforms enable Indigenous activists to bypass mainstream media that historically marginalized their perspectives (Castells, 2015). Digital campaigns have drawn international attention to Indigenous-led environmental struggles, building solidarity and applying pressure on governments and corporations.

Language diversity on social media creates both opportunities and challenges for climate communication. While English dominates many online environmental conversations, movements in non-English-speaking regions develop their own digital climate cultures (Pearce et al., 2019). Translation efforts and multilingual campaigns attempt to bridge language barriers, though much climate content remains inaccessible to non-English speakers.

The Digital Divide and Environmental Justice

The digital divide represents a significant equity concern within digital environmentalism. Unequal access to technology and digital literacy means that social media environmental movements may inadvertently exclude marginalized communities who are often most affected by climate change (Sein and Harindranath, 2004). This creates a risk of environmental movements that are digitally visible but not representative of the populations most impacted by environmental degradation.

Socioeconomic factors shape who can participate in digital environmentalism. Reliable internet access, devices capable of accessing social media, and time to engage online are not universally available. Low-income communities, rural populations, and older individuals face barriers to digital participation (van Dijk, 2020). When environmental movements rely primarily on social media organizing, they may fail to engage these communities meaningfully.

Digital literacy varies significantly across populations, affecting the ability to navigate social media platforms, evaluate information quality, and participate effectively in online environmental discourse. Educational disparities, age, and prior technology exposure influence digital literacy levels (van Dijk, 2020). Environmental organizations must consider these variations when designing digital campaigns and provide multiple pathways for engagement beyond social media.

Climate justice advocates emphasize that digital environmentalism must address rather than reinforce existing inequities. This requires intentional efforts to amplify marginalized voices, ensure accessibility of digital content, and complement online organizing with offline outreach (Schlosberg & Collins, 2014). Hybrid approaches that combine digital and traditional organizing methods can build more inclusive movements.

Some initiatives specifically address the digital divide in environmental movements. Community technology centers provide internet access and digital literacy training in underserved areas. Environmental organizations partner with community groups to ensure that digital campaigns reflect diverse perspectives and reach beyond typical social media audiences. These efforts recognize that effective climate action requires participation from all communities, not just those with digital access.

Organizational Adaptation and Digital Strategy

Traditional environmental organizations have had to adapt their strategies and operations in response to social media's rise. Established groups like Greenpeace and Sierra Club have developed sophisticated digital presences, hiring social media managers and content creators to maintain relevance with younger, digitally native audiences (Ackland and O'Neil, 2011). This organizational adaptation reflects recognition that social media has become an essential infrastructure for contemporary environmental advocacy.

Digital-native environmental organizations represent a new generation of activist groups built around social media engagement. Organizations like 350.org and Extinction Rebellion emerged in the social media era and designed campaigns specifically for digital amplification (Fisher, 2019, 2024). Their organizational structures tend to be more decentralized and networked than traditional environmental groups, reflecting social media's architecture.

Competition for attention on crowded social media platforms pushes environmental organizations toward increasingly sophisticated content strategies. Organizations invest in professional photography, video production, and data visualization to create shareable content that stands out (Pearce et al., 2019). This professionalization raises questions about authenticity and accessibility, as well-resourced organizations may dominate digital spaces.

Metrics and analytics shape organizational decision-making about digital environmental campaigns. Organizations track engagement rates, reach, and conversion to measure campaign effectiveness and adjust strategies accordingly (Guo

& Saxton, 2014). This data-driven approach can improve campaign design but may also encourage focus on metrics that don't necessarily correlate with meaningful environmental outcomes.

Collaboration between environmental organizations has been facilitated by social media networks. Digital platforms enable rapid coordination on joint campaigns, resource sharing, and unified messaging around environmental issues (Segerberg & Bennett, 2011). These collaborative networks can amplify impact while allowing organizations to maintain their distinct identities and approaches.

Corporate Responses and Greenwashing

Social media has transformed corporate communication around environmental issues, creating both opportunities for genuine engagement and risks of greenwashing. Companies increasingly use social media to promote environmental initiatives and respond to criticism (Cho et al., 2012). The interactive nature of platforms means corporations face immediate public scrutiny of their environmental claims and practices.

Greenwashing on social media involves companies making exaggerated or misleading environmental claims to appear more sustainable than they actually are. Social media's visual nature lends itself to greenwashing through carefully curated imagery that emphasizes positive environmental actions while obscuring harmful practices (Lyon & Montgomery, 2015). Companies may promote minor sustainability initiatives while continuing significant environmental damage.

Social media users and activist groups increasingly call out corporate greenwashing, using platforms to hold companies accountable. Hashtag campaigns can draw attention to gaps between corporate environmental rhetoric and reality, generating negative publicity that damages brand reputation (Cho et al., 2012). This accountability function represents an important check on corporate environmental communication.

Some corporations have responded to social media pressure by making substantive environmental commitments. Public campaigns targeting specific companies have succeeded in changing corporate policies on issues like plastic packaging, deforestation, and carbon emissions (Lyon & Montgomery, 2015). The reputational risks of being publicly criticized on social media create incentives for improved environmental performance.

The effectiveness of social media in driving corporate environmental improvement remains debated. While platforms enable rapid mobilization against corporate environmental harms, concerns persist that online campaigns may result in superficial changes rather than fundamental shifts in business practices (Lyon & Montgomery, 2015). Sustained pressure combining online activism with other tactics appears most effective.

Challenges and Limitations of Digital Environmentalism

Despite its potential, digital environmentalism faces significant challenges and limitations. The ephemeral nature of social media attention means environmental issues must constantly compete for visibility in crowded feeds (Papacharissi, 2015). Even viral climate content quickly fades from view as new topics emerge, making sustained engagement difficult.

Mental health concerns arise from constant exposure to climate crisis content on social media. Eco-anxiety and climate grief affect many individuals, particularly young people who regularly encounter distressing environmental news online (Pihkala, 2020). While awareness is crucial, overwhelming people with negative content can lead to disengagement and hopelessness rather than action.

The carbon footprint of digital technologies themselves represents a paradox for digital environmentalism. Data centers, network infrastructure, and device manufacturing consume significant energy and resources (Brevini, 2012). This creates tension between using digital platforms for environmental advocacy and the environmental impacts of digital technology itself. The media ecology perspective emphasizes that activists must grapple with this contradiction, considering both the communicative potential and environmental footprint of their digital practices (Bussoletti et al., 2025).

Platform dependency creates vulnerabilities for digital environmental movements. Social media companies control algorithms, features, and policies that shape environmental discourse. Platforms can alter features, change algorithms, or even shut down, disrupting movements that depend on them (Treré, 2019). This dependency limits movement

autonomy and sustainability. Research on Portuguese and Finnish activists reveals ongoing tensions as they negotiate the value of social media platforms, recognizing both benefits and costs of platform dependency (Malafaia & Meriluoto, 2024). Many activists describe their relationship with social media as "making a deal with the devil", acknowledging that platforms are necessary tools while remaining problematic spaces.

The attention economy of social media can distort environmental priorities. Issues that translate well to engaging social media content may receive disproportionate attention compared to equally or more important environmental challenges that are less visually compelling or emotionally immediate (Pearce et al., 2019). This creates risks of misaligned priorities within environmental movements.

Future Directions and Opportunities

Emerging technologies promise to further transform digital environmentalism. Virtual and augmented reality could enable immersive experiences that deepen emotional connection to climate issues and environmental spaces (Markowitz et al., 2018). Artificial intelligence might personalize climate communication or help individuals calculate and reduce their environmental footprints. These technologies present both opportunities and risks for environmental movements.

Integration of social media activism with emerging climate technologies could amplify impact. Platforms might incorporate carbon tracking, facilitate sustainable consumption, or connect users with local environmental initiatives (Guo & Saxton, 2014). Such integration could help translate digital engagement into concrete environmental behaviors more seamlessly.

Greater attention to inclusive digital strategies will be crucial for future environmental movements. This includes addressing the digital divide, centering marginalized voices, and ensuring that digital environmentalism advances rather than hinders environmental justice (Schlosberg & Collins, 2014). Movements must deliberately design campaigns that reach and engage diverse communities.

Improved media literacy education could help social media users better navigate environmental information online. Teaching critical evaluation of sources, recognition of misinformation tactics, and understanding of algorithmic curation would strengthen public capacity to engage productively with climate content (van der Linden et al., 2017). Such education should be integrated into formal schooling and public awareness campaigns.

Hybrid organizing models that strategically combine digital and traditional methods appear most promising for future environmental movements. Rather than viewing online and offline action as competing approaches, effective movements will leverage social media's strengths while maintaining community-based organizing and direct action (Earl & Kimport, 2011). This integration maximizes reach while ensuring substantive engagement.

CONCLUSION

Social media has fundamentally transformed environmental communication and activism, creating unprecedented opportunities for climate awareness and mobilization while introducing new challenges and complexities. Digital platforms have democratized environmental discourse, enabling youth-led movements, amplifying marginalized voices, and facilitating global coordination around climate action. The visual, participatory, and networked nature of social media makes it particularly well-suited for emotional storytelling and community building around environmental issues.

The evidence suggests that social media serves as a powerful tool for raising climate awareness and mobilizing action when used strategically. Successful digital environmental campaigns combine compelling content, strategic use of platform affordances, and pathways from online engagement to offline action. Youth movements like Fridays for Future demonstrate that digital organizing can translate into mass mobilization and meaningful political pressure. Influencers and content creators introduce environmental concerns to diverse audiences who might not otherwise engage with climate issues.

However, digital environmentalism faces significant limitations that must be acknowledged and addressed. The spread of climate misinformation, the risk of performative activism, the digital divide, and the ephemeral nature of social media attention all constrain the effectiveness

of online environmental advocacy. The carbon footprint of digital technologies themselves presents an inherent contradiction. Mental health impacts of constant climate crisis content require careful consideration. The emergence of generative AI introduces both new opportunities for climate communication and serious risks of amplifying misinformation and undermining collective climate action.

Moving forward, environmental movements must develop sophisticated strategies that leverage social media's strengths while mitigating its limitations. This requires hybrid approaches combining digital and traditional organizing, intentional efforts to bridge the digital divide and advance environmental justice, and constant adaptation to evolving platforms and technologies. Greater emphasis on translating online engagement into concrete behavioral and policy changes will be essential.

The relationship between social media and environmental action will continue evolving as technologies change and movements adapt. What remains clear is that digital platforms now constitute essential infrastructure for contemporary climate communication and environmental activism. Understanding how to use these tools effectively, inclusively, and sustainably represents a crucial challenge for environmental movements seeking to mobilize the collective action necessary to address climate change. The future of environmental advocacy will necessarily be digital, but its success will depend on maintaining connections to offline communities, concrete actions, and the material realities of environmental degradation and climate impacts.

REFERENCES

Ackland, R., & O'Neil, M. (2011). Online collective identity: The case of the environmental movement. *Social Networks*, 33(3), 177-190.

Anderson, A. (2013). "Together we can save the Arctic": Celebrity advocacy and the Rio Earth Summit. *Celebrity Studies*, 4(3), 339-352.

Anderson, A. (2014). Media, environment and the network society. *Palgrave Macmillan*.

Ballantyne, A. G. (2016). Climate change communication: What can we learn from communication theory? *WIREs Climate Change*, 7(3), 329-344.

Basch, C. H., Yalamanchili, B., & Fera, J. (2022). #Climate Change on TikTok: A Content Analysis of Videos. *Journal of Community Health*, 47(1), 163-167.

Belotti, F., Donato, S., Bussoletti, A., & Comunello, F. (2022). Youth Activism for Climate on and Beyond Social Media: Insights from FridaysForFuture-Rome. *International Journal of Press/Politics*, 27(3), 718-737.

Boulianne, S. (2015). Social media use and participation: A meta-analysis of current research. *Information, Communication & Society*, 18(5), 524-538.

Boulianne, S., Lalancette, M., & Ilkiw, D. (2020). "School strike 4 climate": Social media and the international youth protest on climate change. *Media and Communication*, 8(2), 208-218.

Brevini, B. (2012). Black boxes are not green: Carbon emissions and hidden environmental impacts of ICT. *Proceedings of the 4th IFIP Conference on Sustainable Internet and ICT for Sustainability*.

Brosch, T. (2025). From individual to collective climate emotions and actions: a review. *Current Opinion in Behavioral Sciences*, 61, 101466.

Bucher, T. (2012). Want to be on the top? Algorithmic power and the threat of invisibility on Facebook. *New Media & Society*, 14(7), 1164-1180.

Buhre, F. (2024). Personalising climate change—how activists from Fridays for Future visualise climate action on Instagram. *Humanities and Social Sciences Communications*, 11, Article 1058.

Bussoletti, A., Treré, E., & Comunello, F. (2025). A media ecology of ecological media? Conceptualizing environment-oriented communication and its digital footprint in climate change activism. *New Media & Society*, 27(4), 2024-2045.

Castells, M. (2015). Networks of outrage and hope: Social movements in the internet age (2nd ed.). Polity Press.

Cho, C. H., Guidry, R. P., Hageman, A. M., & Patten, D. M. (2012). Do actions speak louder than words? An empirical

investigation of corporate environmental reputation. *Accounting, Organizations and Society*, 37(1), 14-25.

Cox, R. (2013). Environmental communication and the public sphere (3rd ed.). *Sage Publications*.

De Moor, J., Uba, K., Wahlström, M., Wennerhag, M., & De Vydt, M. (2020). Protest for a future II: Composition, mobilization and motives of the participants in Fridays For Future climate protests on 20-27 September, 2019, in 19 cities around the world.

De Veirman, M., Cauberghe, V., & Hudders, L. (2017). Marketing through Instagram influencers: The impact of number of followers and product divergence on brand attitude. *International Journal of Advertising*, 36(5), 798-828.

Dekoninck, H., & Schmuck, D. (2024). The "greenfluence": Following environmental influencers, parasocial relationships, and youth's participation behavior. *New Media & Society*, 26(11), 6615-6635.

Dekoninck, H., Van Houtven, E., & Schmuck, D. (2025). Virtual nature experiences on Instagram: How greenfluencers' nature posts drive climate action. *International Journal of Advertising*, 44(2), 620-650.

Earl, J., & Kimport, K. (2011). Digitally enabled social change: Activism in the internet age. *MIT Press*.

Fisher, D. R. (2019). The broader importance of #FridaysForFuture. *Nature Climate Change*, 9(6), 430-431.

Fisher, D. R. (2024). Saving Ourselves: From Climate Shocks to Climate Action. *Columbia University Press*.

Fung, I. C., Duke, C. H., Finch, K. C., Snook, K. R., Tseng, P. L., Hernandez, A. C., Gambhir, M., Fu, K. W., & Tse, Z. T. H. (2016). Ebola virus disease and social media: A systematic review. *American Journal of Infection Control*, 44(12), 1660-1671.

Gannon, V., & Prothero, A. (2018). Beauty bloggers and YouTubers as a community of practice. *Journal of Marketing Management*, 34(7-8), 592-619.

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research*, 35(3), 472-482.

Graves, L. (2018). Understanding the promise and limits of automated fact-checking. *Reuters Institute for the Study of Journalism*.

Guo, C., & Saxton, G. D. (2014). Tweeting social change: How social media are changing nonprofit advocacy. *Nonprofit and Voluntary Sector Quarterly*, 43(1), 57-79.

Haastrup, H. K. (2023). Having fun saving the climate: The climate influencer, emotional labour, and storytelling as counter-narrative on TikTok. *Persona Studies*, 9(1), 36-51.

Hackett, R. A., Forde, S., Gunster, S., & Foxwell-Norton, K. (2017). Journalism and climate crisis: Public engagement, media alternatives. *Routledge*.

Halupka, M. (2018). The legitimisation of clicktivism. *Australian Journal of Political Science*, 53(1), 130-141.

Hart, P. S., Feldman, L., Choi, S., Chinn, S., & Hiaeshutter-Rice, D. (2024). Climate Change Advocacy and Engagement on Social Media. *Science Communication*, 46(6), 733-759.

Hautea, S., Parks, P., Takahashi, B., & Zeng, J. (2021). Showing they care (or don't): Affective publics and ambivalent climate activism on TikTok. *Social Media + Society*, 7(2), 1-14.

IPCC. (2021). Climate change 2021: The physical science basis. *Cambridge University Press*.

Jenkins, H., Shresthova, S., Gamber-Thompson, L., Kligler-Vilenchik, N., & Zimmerman, A. (2016). By any media necessary: The new youth activism. *NYU Press*.

Josefy, M., Dean, T. J., Albert, L. S., & Fitza, M. A. (2017). The role of community in crowdfunding success: Evidence on cultural attributes in funding campaigns to "Save the Local Theater". *Entrepreneurship Theory and Practice*, 41(2), 161-182.

Kirilenko, A. P., & Stepchenkova, S. O. (2014). Public microblogging on climate change: One year of Twitter worldwide. *Global Environmental Change*, 26, 171-182.

Knupfer, H., Neureiter, A., & Matthes, J. (2023). From social media diet to public riot? Engagement with "greenfluencers" and young social media users' environmental

activism. *Computers in Human Behavior*, 139, 107527.

Kristofferson, K., White, K., & Peloza, J. (2014). The nature of slacktivism: How the social observability of an initial act of token support affects subsequent prosocial action. *Journal of Consumer Research*, 40(6), 1149-1166.

Liu, W., Zhao, X., Zhan, M., & Hernandez, S. (2024). Streaming Disasters on TikTok: Examining social mediated crisis communication, public engagement, and emotional responses during the 2023 Maui Wildfire. *Environmental Communication*, 18(7), 945-963.

Lyon, T. P., & Montgomery, A. W. (2015). The means and end of greenwash. *Organization & Environment*, 28(2), 223-249.

Malafaia, C., & Meriluoto, T. (2024). Making a Deal with the Devil? Portuguese and Finnish Activists' Everyday Negotiations on the Value of Social Media. *Social Movement Studies*, 23(2), 190-206.

Markowitz, D. M., Laha, R., Perone, B. P., Pea, R. D., & Bailenson, J. N. (2018). Immersive virtual reality field trips facilitate learning about climate change. *Frontiers in Psychology*, 9, 2364.

Mede, N. G., & Schroeder, R. (2024). The "Greta effect" on social media: A systematic review of research on Thunberg's impact on digital climate change communication. *Environmental Communication*, 18(3), 345-363.

Neumayer, C., & Svensson, J. (2016). Activism and radical politics in the digital age: Towards a typology. *Convergence*, 22(2), 131-146.

Nguyen, H. (2023). TikTok as Learning Analytics Data: Framing Climate Change and Data Practices. *Proceedings of the 13th Learning Analytics and Knowledge Conference*, 45-55.

Nieto-Sandoval, A. G., & Ferré-Pavia, C. (2024). Communicating Climate Change on TikTok During the Climate Summits: From the Environmental Issues to the Politicization of Discourse. *Environmental Communication*, 18(5), 569-588.

Nwafor, G. U., Aghaebe, S. E., Bartholomew, C. E., & Umuze, A. N. (2024). Investigating the Effectiveness of TikTok in Promoting Public Awareness and Engagement on Climate Change Adaptation and Mitigation Measures in Nigeria. *Asian Journal of Education and Social Studies*, 50(12), 279-291.

Papacharissi, Z. (2015). Affective publics and structures of storytelling: Sentiment, events and mediality. *Information, Communication & Society*, 18(2), 174-187.

Pearce, W., Niederer, S., Özkula, S. M., & Sánchez Querubín, N. (2019). The social media life of climate change: Platforms, publics, and future imaginaries. *WIREs Climate Change*, 10(2), e569.

Pickerill, J. (2003). Cyberprotest: Environmental activism online. *Manchester University Press*.

Pihkala, P. (2020). Anxiety and the ecological crisis: An analysis of eco-anxiety and climate anxiety. *Sustainability*, 12(19), 7836.

Rocha-Gomes, M., Rodrigues, A., Oliveira, M., & Silva, P. (2025). Harnessing deep learning to monitor people's perceptions towards climate change on social media. *Scientific Reports*, 15, 3842.

Rooney, M. B., Gregg, R. M., Thiery, W., Hsiang, S., Cutter, S., Jones, B., Jewett, L., & Dahl, K. (2017). Communicating climate science. In Climate Science Special Report: Fourth National Climate Assessment (Vol. 1, pp. 464-476). *U.S. Global Change Research Program*.

San Cornelio, G., Martorell, S., & Ardèvol, E. (2024). “My goal is to make sustainability mainstream”: Emerging visual narratives on the environmental crisis on Instagram. *Frontiers in Communication*, 8, Article 1265466.

Sanford, M., Witkowska, M., Gifford, R., & Formanowicz, M. (2023). Emotional framing in online environmental activism: Pairing a Twitter study with an offline experiment. *Frontiers in Psychology*, 13, Article 1099331.

Schäfer, M. S. (2025). Social media in climate change communication: State of the field, new developments and the emergence of generative AI. *International Journal of Press/Politics*, 30(1), 98-118.

Schlosberg, D., & Collins, L. B. (2014). From environmental to climate justice: Climate

change and the discourse of environmental justice. *WIREs Climate Change*, 5(3), 359-374.

Segerberg, A., & Bennett, W. L. (2011). Social media and the organization of collective action: Using Twitter to explore the ecologies of two climate change protests. *The Communication Review*, 14(3), 197-215.

Sein, M. K., & Harindranath, G. (2004). Conceptualizing the ICT artifact: Toward understanding the role of ICT in national development. *The Information Society*, 20(1), 15-24.

Sultana, B. C., Prodhan, M. T. R., Alam, E., Sohel, M. S., Bari, A. B. M. M., Pal, S. C., Islam, M. K., & Islam, A. R. M. T. (2024). A systematic review of the nexus between climate change and social media: Present status, trends, and future challenges. *Frontiers in Communication*, 9, Article 1301400.

Sunstein, C. R. (2017). #Republic: Divided democracy in the age of social media. *Princeton University Press*.

Treré, E. (2019). Hybrid media activism: Ecologies, imaginaries, algorithms. *Routledge*.

van der Linden, S., Leiserowitz, A., Rosenthal, S., & Maibach, E. (2017). Inoculating the public against misinformation about climate change. *Global Challenges*, 1(2), 1600008.

van der Ven, H., Corry, D., Elnur, R., Provost, V. J., & Syukron, M. (2024). Generative AI and social media may exacerbate the climate crisis. *Global Environmental Politics*, 24(2), 9-18.

van Dijk, J. (2020). The digital divide. *Polity Press*.

Veil, S. R., Buehner, T., & Palenchar, M. J. (2011). A work-in-process literature review: Incorporating social media in risk and crisis communication. *Journal of Contingencies and Crisis Management*, 19(2), 110-122.

Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. *Science*, 359(6380), 1146-1151.

Vu, H. T., Blomberg, M., Seo, H., Liu, Y., Shayesteh, F., & Do, H. V. (2021). Social media and environmental activism: Framing climate change on Facebook by global NGOs. *Science Communication*, 43(1), 91-115.

Weidlich, M., & Kropp, C. (2023). Correcting climate change misinformation on social media: Reciprocal relationships between correcting others, anger, and environmental activism. *Computers in Human Behavior*, 143, Article 107705.

Williams, H. T., McMurray, J. R., Kurz, T., & Lambert, F. H. (2015). Network analysis reveals open forums and echo chambers in social media discussions of climate change. *Global Environmental Change*, 32, 126-138.

Yang, G. (2016). Narrative agency in hashtag activism: The case of #BlackLivesMatter. *Media and Communication*, 4(4), 13-17.