Exploring Digital Environmental Communication through Sonam Wangchuk's Social Media Narratives

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Abstract

Instagram has become a central platform for digital environmental communication, yet the ways in which engagement patterns and hashtag strategies influence public participation in environmental advocacy remain underexplored. As social media increasingly shapes public discourse, understanding how environmental activists use Instagram to mobilize support is essential. The present descriptive mixed-method study examined yearly engagement trends, hashtag frequency, hashtag category performance, and thematic patterns in Sonam Wangchuk's Instagram posts from 2019 to 2025. Using a complete dataset of 477 posts scraped through the Apify Instagram Scraper, the study analyzed likes, comments, and hashtag usage across seven years, followed by qualitative thematic analysis of hashtag categories and follower responses. Descriptive findings revealed distinct fluctuations in engagement, with a gradual rise from 2019 to 2023 and a substantial peak in 2024 during major campaigns such as #SaveLadakh and #ClimateFast, followed by a moderate decline in 2025. Hashtag frequency analysis showed that campaign-specific and environmental hashtags appeared most prominently and also generated the highest engagement. Qualitative themes indicated that Wangchuk's communication strategy integrates environmental crisis framing, activism and mobilization, regional identity, sustainable innovation, and personal eco-philosophy. Together, these results suggest that Instagram functions as both an informational and mobilizing tool for environmental advocacy, highlighting the importance of strategic hashtag use and narrative framing in digital activism.

Keywords: Digital Media, Instagram Engagement, Sonam Wangchuk, Environmental communication, Hashtag Analysis

Introduction

Digital platforms such as Instagram have become central to how contemporary audiences engage with environmental discourse, public advocacy, and collective social action. Their visually immersive design, built on image-based storytelling, short videos, and algorithmically curated content streams, has transformed how individuals encounter information about climate change, sustainability, and ecological challenges. Instagram's recommendation infrastructure continuously analyses user interactions, content preferences, and behavioural patterns to deliver personalized environmental narratives, thereby shaping both visibility and engagement (Ryhanen, 2019; Alzubi, 2023). Although such personalization enhances reach and public participation, it also raises important questions about how digital communication tools, particularly hashtags, influence public awareness and mobilization within environmental movements.

Environmental communication on social media operates through symbolic expressions, identity markers, and visually driven narratives. Hashtags, in particular, serve as both content organizers and socio-political signals, generating thematic coherence and connecting individual posts to broader environmental movements (Ratih et al., 2025). They help frame issues, mobilize audiences, and cultivate emotionally resonant messages. In the context of climate activism, hashtags form the backbone of digital campaigns, allowing activists to disseminate urgent calls for action and enabling communities to form shared interpretations of ecological crises. This mode of communication aligns with scholarship suggesting that digital media practices not only reflect but actively shape public meaning-making, emotional resonance, and collective identity within environmental discourse.

Within India's environmental landscape, Sonam Wangchuk stands out as a highly influential climate activist, educator, and innovator whose work has reached global recognition. His initiatives, including the Ice Stupa artificial glacier project, the Himalayan Institute of Alternatives, Ladakh (HIAL), and multiple grassroots environmental campaigns, have positioned him as a leading voice on climate resilience in the Himalayan region. Over the years, his Instagram presence has evolved into a crucial platform through which he disseminates environmental knowledge, mobilizes public support, and documents climate challenges in Ladakh and the broader Himalayan ecosystem. His posts frequently incorporate hashtags such as #SaveLadakh, #SaveHimalayas, #ClimateFast, #IceStupa, and #ClimateAction, which anchor his messages within broader national and global climate movements.

As a public figure whose environmental activism merges scientific innovation, regional identity, and political advocacy, Wangchuk's Instagram becomes an essential site for studying digital environmental communication. His account provides a rich dataset for examining how hashtags shape engagement patterns, how audiences respond to environmental messaging, and how digital activism operates within algorithm-driven environments. The prominence of his campaigns, reflected in significant spikes in likes, comments and public participation in specific years, underscores the potential influence of curated environmental narratives in shaping public engagement.

Despite the growing body of research on digital communication and strategic social media use, important gaps remain. Much of the existing literature focuses on branding, influencer culture, or general audience behavior, but rarely analyzes long-term patterns of environmental activism on platforms like Instagram. Furthermore, although hashtags are widely acknowledged as tools of visibility, limited work has examined how different categories of hashtags, such as environmental, activism-focused, location-based, or innovation-oriented tags, relate to measurable engagement outcomes. Finally, environmental activism studies often emphasize offline mobilization or policy advocacy, overlooking how digital platforms construct emotional, cultural, and symbolic dimensions of climate communication.

The present study addresses these gaps by conducting a comprehensive analysis of Sonam Wangchuk's Instagram posts from 2019 to 2025. It examines how hashtag usage trends have evolved, how different hashtag categories influence likes and comments, and how digital communication strategies contribute to public engagement with environmental issues. By situating the analysis within both quantitative metrics and qualitative thematic interpretation, this study provides insight into how environmental activism is shaped, amplified, and sustained within digital ecosystems.

Research Questions

- RQ1: What are the yearly patterns of Instagram engagement on Sonam Wangchuk's posts from 2019 to 2025?

- RQ2: What is the frequency and distribution of hashtags used by Sonam Wangchuk in his Instagram posts between 2019 and 2025?

- RQ3: Which hashtag categories are associated with higher descriptive engagement levels on Sonam Wangchuk's Instagram posts?

- RQ4: How does Sonam Wangchuk's use of Instagram reflect his digital communication strategy and environmental advocacy efforts?

Research Design

The present study employed a descriptive and qualitative research design to examine Instagram engagement patterns, hashtag usage, and digital communication strategies of Sonam Wangchuk from 2019 to 2025. This mixed descriptive approach was chosen because it allows an in-depth understanding of digital engagement trends without relying on inferential statistics.

Participants

In the present study, the term "participants" refers to the Instagram posts made by Sonam Wangchuk on his official account between July 2019 and 2025. Since the data was entirely observational and sourced from publicly available social media content, no human participants were directly involved.

A total of 477 Instagram posts were included in the dataset. These posts consisted of images, videos, captions, and associated metadata, including likes, comments, timestamps, and hashtags. Engagement values (likes and comments) reflect audience interaction with these posts across the selected years.

Sampling Procedure

A non-probability total population sampling technique was used, in which all available Instagram posts from Sonam Wangchuk's account between 2019 and 2025 were extracted and included in the analysis. This method ensures complete coverage of the digital communication activity during the selected time frame.

Inclusion Criteria

Posts were included if they met all of the following conditions:

1. Published on Sonam Wangchuk's official Instagram profile.

2. Dated between 1 July 2019 and 31 October 2025.

3. Contained at least one measurable engagement indicator (likes, comments).

4. Contained extractable metadata (timestamp, caption, hashtags).

Exclusion Criteria

Posts were excluded:

1. They were Instagram Stories (24-hour disappearing content).

2. They were live sessions without replay data available.

3.   They contained missing or corrupted metadata.

4.   They were posts made outside the target timeframe.

The inclusion and exclusion criteria ensured that only complete, publicly accessible, and analysable posts were included in the study.

Tools Used

In the present study, Data for all Instagram posts was collected using the Apify Instagram Scraper, a specialized automated web-extraction tool. The scraper was used to collect the following data: Post timestamps, like count, Comment count, Captions, all hashtags attached to each post, Post type (image/video), and URL identifiers (for verification purposes only). The scraper ensured accurate, consistent, and systematic data extraction across the entire dataset, reducing manual errors and enabling the creation of a structured dataset.

Data Collection Procedure

The data collection process for the present study involved multiple systematic steps to ensure accuracy and consistency. First, the timeframe of 2019 to 2025 was selected to capture long-term Instagram engagement patterns during significant environmental campaigns led by Sonam Wangchuk. The official and verified Instagram handle of Sonam Wangchuk was then identified as the primary source of data. Using the Apify Instagram Scraper, all available posts within the selected period were extracted through custom configurations that retrieved post-level metadata, including likes, comments, captions, timestamps, and hashtags. The scraper exported the raw data in structured Excel formats, which were subsequently cleaned and prepared for analysis. During data cleaning, duplicate entries, corrupted rows, and missing values were removed. Hashtags were standardized to lowercase and organized into predefined categories, and timestamps were converted into usable date-year variables. Once cleaned, the dataset was systematically organized into key variables, including year, likes count, comments count, total number of hashtags, hashtag categories, and caption content. Descriptive analysis was conducted by calculating yearly averages of engagement metrics and generating frequency counts for each hashtag category. Additionally, Braun and Clarke's six-step thematic analysis was applied to qualitatively categorize hashtags into themes and subthemes representing activism, environmental awareness, sustainability, innovation, and regional identity. The final dataset provided a comprehensive foundation for identifying digital communication patterns and understanding how Sonam Wangchuk's Instagram activity reflects his environmental advocacy across the seven-year period.
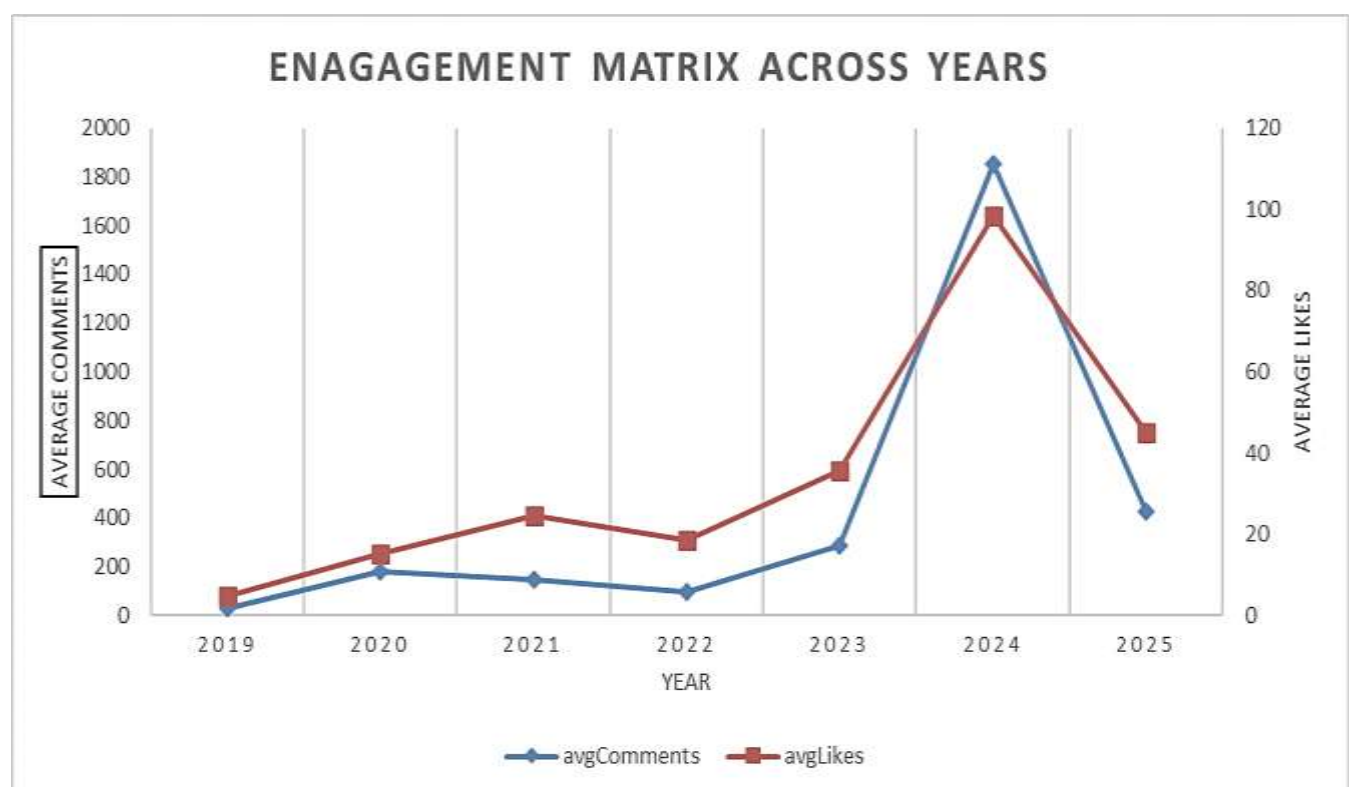
Quantitative Results

Descriptive Statistics

Descriptive statistics (see Table 1 and Figure 1) demonstrate clear variations in Instagram engagement across the years 2019 to 2025. Average likes increased from $M = 4.8$ in 2019 to $M = 98.4$ in 2024, whereas average comments rose from $M = 32$ in 2019 to $M = 1850$ in 2024. Engagement declined slightly in 2025 (likes: $M = 45.2$, comments: $M = 425$), though still remaining higher than in the earlier years. The engagement trend (Figure 1) shows a steady rise from 2019 to 2023, a major spike in 2024 linked to high-impact environmental campaigns, and a subsequent decline in 2025, as the data is for October 31 only.

Table 1

Mean Instagram Engagement Across Years (2019–2025)

Year	Average Likes	Average Comments
2019	4.8	32
2020	15.2	178
2021	24.5	145
2022	18.6	95
2023	35.8	285
2024	98.4	1850
2025	45.2	425

Note. Higher values indicate greater descriptive engagement.

Figure 1

Mean Likes and Comments Across Years

Hashtag Frequency and Distribution

Descriptive analysis of hashtag use (Table 2, Figure 2) revealed that campaign-related hashtags were used most frequently across the dataset, followed by hashtags related to environmental and regional categories. Figure 2 shows that **#SaveLadakh**, **#SaveHimalayas**, and **#ClimateFast** appeared most frequently and dominated the visual representation of hashtag frequency.
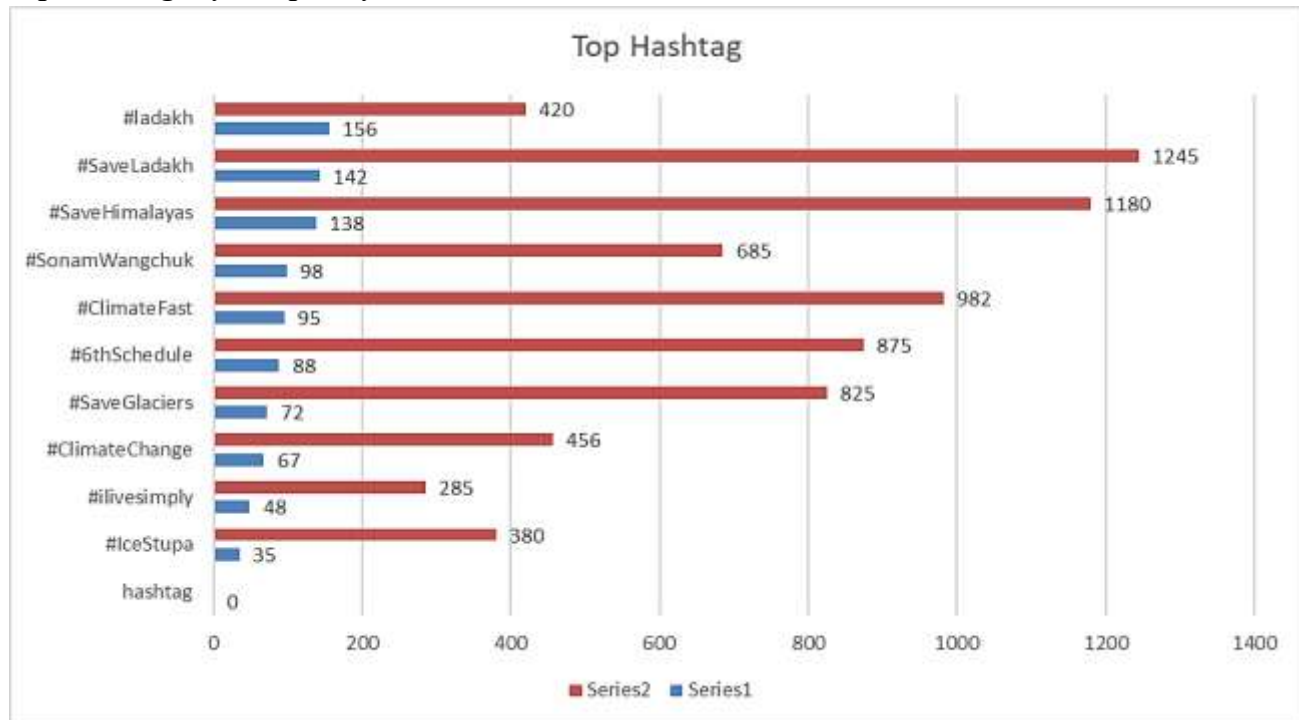
Table 2

Top 10 Frequently Used Hashtags on Sonam Wangchuk's Instagram

Hashtag	Frequency
#SaveLadakh	1245
#SaveHimalayas	1180
#ClimateFast	982
#6thSchedule	875
#SaveGlaciers	825
#SonamWangchuk	685
#ClimateChange	456
#IceStupa	380
#Ladakh	420
#LiveSimply	285

Figure 2

Top Hashtags by Frequency

Engagement Levels Associated with Hashtag Categories

A descriptive comparison (Table 3, Figure 3) indicates that campaign-specific hashtags yielded the highest engagement levels. Posts containing hashtags such as **#SaveLadakh**, **#ClimateFast**, and **#SaveHimalayas** yielded the most comments and likes, especially during peak activism periods (2023–2024). Environmental hashtags demonstrated moderate to high engagement, whereas lifestyle or personal-value hashtags showed comparatively lower engagement.
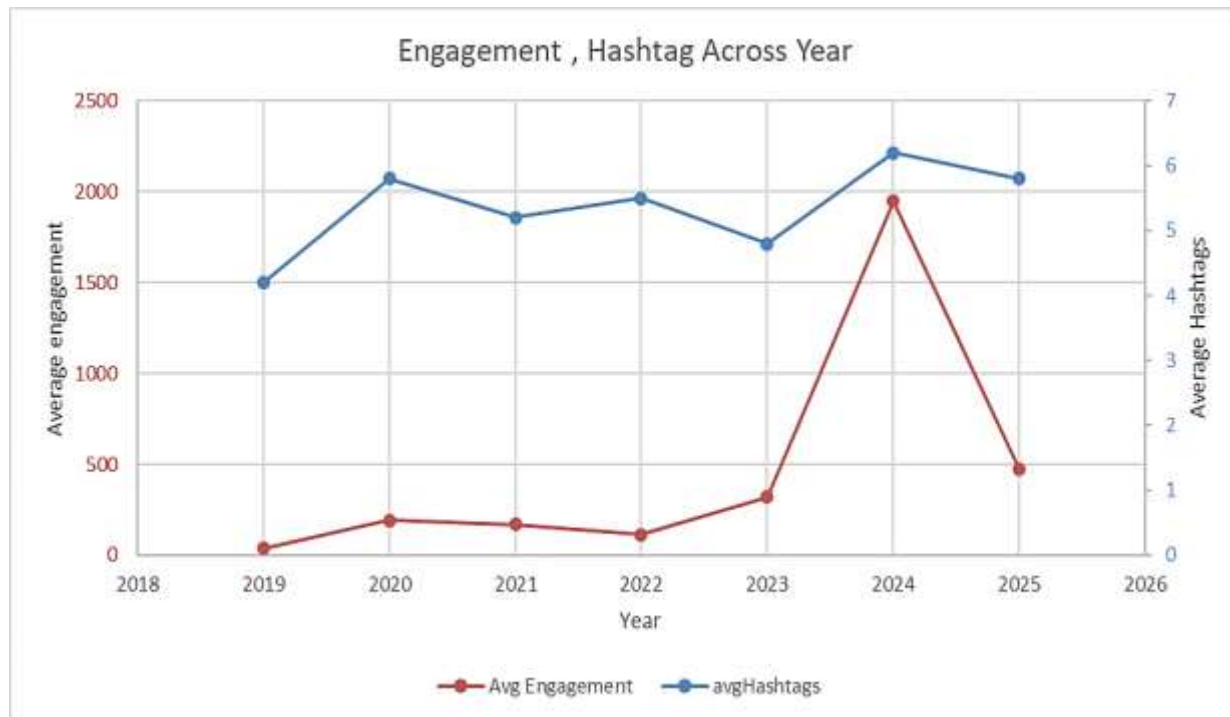
Table 3

Hashtag Categories and Associated Engagement (Descriptive Summary)

Category	Example Hashtags	Engagement Trend
Campaign-Specific	#SaveLadakh, #ClimateFast	Highest engagement
Environmental	#ClimateChange, #SaveGlaciers	High engagement during activism peaks
Region/Culture	#Ladakh, #Himalayas	Moderate–consistent engagement
Innovation/Education	#IceStupa, #HIAL	Moderate engagement
Lifestyle/Values	#LiveSimply	Low–steady engagement

Figure 3

Engagement Levels by Hashtag Category

Qualitative Results

Qualitative analysis was conducted using Braun and Clarke's six-step method to explore how Sonam Wangchuk's digital communication reflects his environmental advocacy. The thematic analysis reveals six major themes supported by sample comments from followers.

The thematic analysis generated six overarching themes representing the core dimensions of Wangchuk's digital advocacy: Environmental Crisis & Awareness, Activism & Mobilization, Cultural Identity & Place, Sustainable Innovation, Campaign-Specific Advocacy, and Personal Values.

Table 4

Thematic Summary of Qualitative Findings from Hashtags and Audience Comments

Theme	Subthemes	Observed Pattern	Illustrative Examples
Environmental Crisis & Awareness	Climate change, ecological responsibility	Posts highlight Himalayan vulnerabilities and global warming	"Spiti is facing scarcity of water…" Comments in post of sonam wangc…
Activism & Mobilization	Protest calls, collective action	High-engagement posts linked to mass digital and offline mobilization	"Thank you for standing up for nature!" Comments in post of sonam wangc…
Cultural Identity & Place	Ladakh, Himalayas	Posts emphasize cultural pride and regional belonging	"Ladakh needs protection…"
Sustainable Innovation & Education	Ice Stupa, HIAL	Followers respond to science-driven ecological solutions	"Your innovation inspires the youth!"
Campaign-Specific Advocacy	#ClimateFast2024, #SaveLadakh	Strong alignment with high engagement years (2023–2024)	"We support the movement!"
Personal Values & Eco-Philosophy	Simplicity, ethical leadership	Followers resonate with Wangchuk's moral voice	"Your lifestyle is inspiring."

Discussion

The present study examined the patterns of Instagram engagement on Sonam Wangchuk's posts from 2019 to 2025, the frequency and distribution of hashtags across these years, engagement associated with different hashtag categories, and the ways in which Wangchuk's digital communication strategy reflects his broader environmental advocacy efforts. Through the integration of descriptive quantitative findings and qualitative thematic analysis, the study offers a comprehensive understanding of how environmental activism is shaped,

communicated, and amplified through Instagram. The findings highlight the strategic role of hashtags, narrative framing, and online audience participation in enhancing environmental communication and mobilizing support for regional and global environmental causes.

Yearly Engagement Patterns

The engagement patterns observed across the seven-year period revealed substantial variation, reflecting both the dynamic nature of environmental activism and the responsiveness of digital audiences to evolving socio-political contexts. Engagement increased steadily from 2019 through 2023, peaked dramatically in 2024, and declined in 2025 as the data has been taken till 31/10.2025 and current scenario has been changes due to Sonam Wangchuk arrest under NSA (the arrest allegation are false as per the sources) while remaining significantly higher than in the initial years. These fluctuations suggest that audience engagement on Wangchuk's Instagram is not uniform but influenced by external events such as protests, environmental crises, and political mobilizations.

The sharp rise in engagement during 2024 corresponds with heightened offline activism, particularly the #ClimateFast and #SaveLadakh campaigns. This pattern aligns with existing research showing that digital engagement spikes during periods of heightened collective action, as social media platforms amplify content perceived as urgent, emotionally salient, or politically relevant (Ratih et al., 2025; Ryhänen, 2019). Instagram's visually immersive interface, combined with algorithmic curation, tends to spotlight posts that evoke emotional intensity or trigger large-scale participation, resulting in increased visibility and audience involvement. As highlighted in *Towards a Theory of Digital Media* (Schroeder, R 2018) digital platforms operate through algorithmic "visibility logics" that reward interaction, thereby reinforcing high-engagement content and facilitating rapid information diffusion.

Qualitative responses from followers during high-engagement years further illuminate the psychological and emotional dimensions driving these patterns. Comments expressing solidarity, gratitude, and collective concern were common, particularly under posts addressing urgent environmental threats or advocating for political change in Ladakh. These interactions demonstrate the affective turn in digital activism, where emotional expression and personal identification with causes shape audience participation. Research suggests that when activists frame messages within emotionally charged narratives, followers are more likely to respond empathetically and share content, creating what scholars describe as a "digital ripple effect" (Ryhänen, 2019). In this sense, the observed engagement patterns underscore the reciprocal relationship between emotional resonance, environmental urgency, and algorithmic amplification.

Hashtag Frequency and Distribution

The analysis of hashtag frequency and distribution revealed that campaign-specific hashtags (#SaveLadakh, #ClimateFast, #SaveHimalayas #delhichalo) constituted the most dominant category. These were followed by environmental hashtags (#ClimateChange), regional identity tags (#Ladakh, #Himalayas), and innovation-oriented hashtags (#IceStupa). This distribution highlights a deliberate and consistent communication strategy, where hashtags serve as thematic anchors used to direct attention toward specific environmental and political objectives.

This pattern is consistent with earlier studies that emphasize the role of hashtags in organizing communication, shaping discourse, and enhancing discoverability (Ryhänen, 2019). Hashtags act as linguistic signifiers that categorize posts and link them to broader conversations, thereby expanding their reach beyond an influencer's direct follower base. The prominence of campaign-specific hashtags suggests deliberate agenda-setting, where repeated use creates sustained visibility around particular issues. Ratih et al. (2025) argue that effective

communication campaigns rely on repeated symbolic markers—like hashtags—to reinforce message framing and promote collective identification.

The strong presence of regional hashtags such as #Ladakh and #Himalayas reflects an identity-based communication approach. Environmental activism rooted in place-specific narratives fosters authenticity and contextual relevance, enabling audiences to better understand the cultural and ecological stakes involved. Alzubi (2021) found that environmental communication rooted in local identity enhances trust and emotional resonance, helping audiences connect abstract ecological issues to tangible geographic realities. Wangchuk's repeated invocation of Ladakhi identity thus operates not only as a communication choice but as an activist strategy—tying environmental concerns to cultural preservation, indigenous rights, and regional sustainability.

The clustering of hashtags into coherent categories also demonstrates a well-developed digital communication strategy rather than a random or unfocused tagging practice. As *Towards a Theory of Digital Media* (Schroeder, R. 2018) suggests, effective digital communication often emerges from recognizable narrative ecosystems, where symbolic markers like hashtags stabilize meaning and facilitate thematic continuity. Wangchuk's repeated use of distinctive hashtags establishes such a narrative ecosystem, guiding followers through his evolving environmental advocacy.

Engagement Levels Across Hashtag Categories

Descriptive results indicate that engagement levels varied across hashtag categories, with campaign-specific hashtags generating the highest levels of likes and comments. This reinforces theoretical claims that emotionally charged, action-oriented hashtags yield greater audience response compared to informational or lifestyle-oriented hashtags. Campaign hashtags act as "mobilizing frames"—they encapsulate calls to action, articulate grievances, and signal opportunities for participation (Ratih et al., 2025). When audiences encounter such frames, they are more likely to respond through likes, comments, and shares, contributing to the viral potential of environmental campaigns.

Environmental hashtags also produced moderate-to-high engagement, especially during periods of heightened environmental discourse. Posts tagged with #ClimateChange or #SaveGlaciers attracted considerable attention, aligning with global concerns around climate crisis and environmental degradation. These findings resonate with Ryhänen's (2019) argument that environmental content often sparks emotional engagement due to shared anxieties and moral concerns surrounding planetary futures.

Regional and cultural hashtags produced consistent engagement but not at the peak levels observed for campaign-specific tags. This suggests that while cultural identity fosters trust and authenticity, mobilization may require more explicit calls to action. Innovation-oriented hashtags such as #IceStupa and #HIAL displayed moderate engagement, reflecting audience interest in scientific solutions and sustainable practices but perhaps lacking the emotional immediacy of campaign hashtags.

Qualitative insights support these patterns. Comments on campaign-tagged posts frequently reflected solidarity, moral obligation, and calls for further action, indicating higher emotional and ideological investment. Conversely, comments on innovation-focused posts tended to express admiration or curiosity rather than mobilization, which may explain their relatively moderate engagement.

The relationship between hashtag categories and engagement underscores that digital activism is not solely about content visibility—it is also about emotional framing. Hashtags that evoke urgency, identity, or collective struggle tap into deeper affective reservoirs, prompting audience responsiveness.

Digital Communication Strategy and Environmental Advocacy

The integration of quantitative and qualitative findings reveals a multi-layered digital communication strategy that Wangchuk employs to advance environmental advocacy. Six central qualitative themes emerged: Environmental Crisis & Awareness, Activism & Mobilization, Cultural Identity, Sustainable Innovation, Campaign Advocacy, and Personal Values. Together, these themes reflect a carefully crafted narrative framework that combines emotional appeal, factual information, cultural grounding, and moral leadership.

Environmental Crisis & Awareness frames ecological problems in the Himalayas as both urgent and globally relevant, aligning with environmental communication models emphasizing the importance of emotive problem framing (Ryhänen, 2019). Activism & Mobilization highlights public participation and collective action, mirroring digital protest models where social media acts as a coordination tool for offline action (Ratih et al., 2025).

Cultural Identity anchors environmental issues within the cultural and ecological landscape of Ladakh, reinforcing messages through localized authenticity. Alzubi (2021) found that region-specific framing in environmental communication enhances community trust, which is evident in the follower responses under posts tagged with #Ladakh or #Himalayas.

Sustainable Innovation showcases technological solutions such as the Ice Stupa, which aligns with solution-oriented environmental communication that blends optimism with actionable change. Research suggests that audiences respond positively to such messages because they combine hope with practical pathways for environmental improvement (Ryhanen, 2019).

Campaign Advocacy and Personal Values further deepen the narrative by linking individual responsibility with structural and policy-driven change. Followers frequently referenced Wangchuk's moral example, reflecting an influencer-driven model of environmental leadership where personal conduct enhances message credibility.

Collectively, these themes illustrate a holistic communication strategy in which Wangchuk blends emotion, cultural identity, scientific knowledge, and moral leadership to shape environmental discourse on Instagram. The combination of narrative consistency and strategic hashtag deployment enables his posts to resonate deeply with diverse audiences.

Integration of Quantitative and Qualitative Findings

The convergence of results indicates that engagement patterns, hashtag distribution, and audience responses are deeply intertwined. Years marked by major environmental campaigns (especially 2024) saw increased hashtag usage, higher emotional intensity, and greater engagement. Qualitative themes amplify these patterns by highlighting how environmental messaging, activism narratives, and regional framing foster both emotional investment and digital mobilization.

These reciprocal dynamic parallels the broader scholarship on strategic communication and digital activism, which argues that online engagement is shaped by a combination of content strategy, algorithmic visibility, and audience emotional alignment (Ratih et al., 2025; Ryhanen, 2019). In this context, Wangchuk's Instagram account operates as both a communication channel and a mobilization mechanism, transforming localized environmental issues into widely shared public concerns. His posts, supported by thematic hashtags and narrative framing, create a digital ecosystem that encourages followers to participate emotionally, cognitively, and in some cases, politically.

The present study demonstrates that environmental communication on Instagram is most impactful when it integrates consistent thematic framing, strategic hashtag use, cultural identity markers, and emotionally resonant storytelling. Wangchuk's digital strategy exemplifies how environmental influencers can leverage social media to shape public discourse, mobilize collective action, and amplify environmental movements at local, national, and global scales.

Conclusion

The present study reveals that Instagram engagement on Sonam Wangchuk's posts varied notably across the years, peaking during significant environmental campaigns. Hashtag frequency and distribution patterns demonstrated strong reliance on campaign-specific and environmental tags, which produced the highest engagement. Qualitative themes revealed that Wangchuk's digital communication strategy effectively integrates environmental awareness, cultural identity, innovation-focused solutions, and moral appeals, positioning Instagram as a major channel for environmental advocacy.

These findings support existing literature on strategic communication, demonstrating that digital platforms amplify engagement when content is emotionally salient, culturally grounded, and thematically consistent (Ryhanen, 2019; Ratih et al., 2025). The synergy between messaging, hashtag use, and real-world events underscores the importance of strategic digital storytelling in environmental activism.

Future research may expand on this by comparing multiple environmental influencers, examining cross-platform communication, or analyzing whether high online engagement translates to offline mobilization. Nonetheless, this study provides a meaningful contribution to understanding how digital advocacy shapes public engagement with environmental issues in India and beyond.

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