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Exploring the Impact of Social Media on Public Understanding of Climate Change in Punjab, Pakistan

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ABSTRACT

Aim of the Study: Environmental deterioration, one of the most critical global challenges of our times, calls for swift and well-organized responses. Public broadcasting in the contemporary period has become a chief avenue for spreading knowledge, encouraging debate, and stimulating participation in climate issues. This research examines how social media aids Punjab, Pakistan, in making environmental conversion appointments and enhancing community awareness.

Methodology: The research employs a mixed-methods approach and involves recorded interviews and surveys with social media influencers, policymakers, and environmental experts. The survey employed a Google Forms-created questionnaire that was shared via Whatsapp among various academically diverse groups. It had seventeen closed-ended questions on it. The sample of the study comprised 233 respondents who filled out the questionnaire employing a convenient and manageable sampling strategy.

Findings: The results indicate that social media can be an effective means for public education, opinion shaping, and shaping environmental change policy debates. Moreover, the training highlights the barriers encountered when using electronic channels for environmental advocacy and effective communication methods.

Conclusion: The research concluded that social media can efficiently bring awareness and interaction regarding climate change. In addition, it underlines the importance of including social media in environmental communication strategies. These findings may assist researchers, practitioners, and policymakers in employing social media more effectively to disseminate messages regarding environmental change.

Keywords: Climate Change, Public Perception, Public Awareness, Social Media.

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1. INTRODUCTION

With significant effects on communities, cost-effective systems, and environmentally friendly systems, climate change is one of the most challenging issues of our time. The risks are especially high in Punjab, Pakistan, a region that depends largely on agriculture. Food security and livelihoods are at risk due to shifting agricultural zones, altered rainfall patterns, and an increase in extreme weather events (Mustafa, 2017).

These changes have an impact on the socioeconomic stability of agricultural workers throughout the region, not just on individual production. Millions of people's lives are in danger, but the food security and economic stability of the area are also at risk due to these developments (Safdar and Bibi, 2025; Shabir et al., 2015).

Shared mass media may be cast-off as a easy-going tool, gradually changing people's attitudes and actions by exposing them to pertinent discussions and material over time (Safdar and Abbasi, 2020; Shabir et al., 2015a).

Over the past few decades, one of the best conversed matters takes been environment change. Comprehensive and practical measures have not yet been done, despite the fact that most nations currently cooperate on global initiatives similar the Kyoto Practice and the Paris Contract and agree on the basic principles relating to climate change. Claims of national interest have hindered and stagnated the political process (Wong et al., 2014).

The relationship among shared broadcasting and community responsiveness of the environment change concern has been the subject of several researches. According to Anderson's analysis, nearby is specific data that distribution data on social media can increase people's knowledge of environmental issues and inspire them to take eco-friendlier actions.

However, it should be noted that social media usage fire also outcome in view grain storage and view support, which can have equally positive and negative effects on the matter of environment change. In order to evaluate user views on environment change, Williams et al. employed a large dataset from Tweet. They found that in communities of like minds, groups are usually split, usually along extremes of the accept/reject spectrum, with fewer people expressing less extreme opinions (Hara, 2018; Shabir et al., 2015b; Shabir et al., 2014).

The Fifth Assessment Report of the IPCC states that human activity is "very likely" (90–100% likelihood) to be the cause of our planet's rising warming, which in turn causes some extreme weather events. According to a survey conducted in April 2013, 63% of Americans thought that climate change was real. But when asked if people are the reason of climate change, this percentage falls to 49%. When asked if the properties of climate change are currently harming people worldwide, the number falls once further to 38%. States and counties may have different views on these risks and attitudes.

However the consensus among 97% of working, published environment change experts is that "human activity is a significant contributing factor in changing mean global temperatures".

1.1 Research objectives

- Toward assess the current level of public responsiveness about environment change in Punjab.
- To examine how social media contributes to the spread of climate change evidence.
- To determine the best social media tactics for raising awareness and public participation.

2. LITERATURE REVIEW

The cumulative effects of climate change have necessitated innovative ways of raising public awareness and initiating action. Social media enables the dissemination of data and engagement of the public concerning environmental issues, thanks largely to its wide reach and communication environment. This

review surveys current research concerning the role of social media in climate change responsiveness with Punjab, Pakistan, as a case study.

Larger media include Facebook, Instagram, YouTube, and Twitter, which are valuable platforms for communicating climate change information. They facilitate rapid information communication, create avenues for dialogue, and support networking for collective action. Williams et al. (2015) argued that social media campaigns could seriously build public interest and involvement in environmental causes. Likewise, Anderson (2017) pointed out the role of social media in changing behaviours and perceptions concerning climate actions.

The knowledge deficiency is generally reflected in the public opinion about climate change. One survey found that 63 percent of Americans said climate change is occurring, and only 49 percent said it is primarily caused by human activities. This gap illustrates the level of misconceptions commonly held on the issue. On the contrary, scientific consensus is very strong, with 97 percent of published climate scientists agreeing that human activity is indeed causing much of the increase in the Earth's average temperature.

The urgency of the matter has been particularly amplified by youth activism. On March 15, 2019, about 1.6 million scholars from roughly 120 nations participated in institute strikes to demand stronger climate action. This global protest demonstrated the determination of younger generations to address the crisis.

Overall, media particularly social media holds the potential to educate the public, close knowledge gaps, and inspire individual and collective action to combat environment change.

The written film "Before the Flood" on the NatGeo network garnered an impressive 60 million views globally. Such initiatives can bridge the knowledge gap and inspire collective action to mitigate climate change impacts.

Punjab, Pakistan is highly vulnerable to climate-related tests, with water lack and agricultural disruptions, which pose significant risks to the region's food security and economic stability (Faisal Nadeem, Brent Jacobs, & Dana Cordell, 2024). Climate change affects agriculture through increased infections, adjustable rainfall, and dangerous climatic measures such as warmness breakers, overflows, and lacks. According to a study, Punjab province has and will likely continue to experience severe effects of climate change, including drought and flooding, with direct losses from floods over the last decade estimated to exceed USD 18 billion (Faisal Nadeem et al., 2024).

Climate change has led to a 1°C rise in disease, reducing wheat produces by 5-7% in semiarid and 6-9% in sub-humid areas. Upcoming projections indicate a potential decline in rice yields by 15% from 2012 to 2039, 25% from 2040 to 2069, and 36% from 2070 to 2099. To combat these challenges, the Punjab cabinet has approved a comprehensive climate change policy and action plan, aiming to decrease glasshouse gas radiations by 25% in 2030, increase green areas in 5% in 2027, and transition 60% of Punjab's drive needs to other causes like biomass, wind, and planetary.

2.1 Hypotheses

H1: Coverage to climate change satisfied on social media rises public awareness in Punjab, Pakistan.

H2: Engagement with social media influencers boosts public contribution in climate change events in Punjab, Pakistan.

H3: The type of content (e.g., videos, infographics) shared on social media influences public visit with climate change issues in Punjab, Pakistan.

H4: Social media raised part play a important role in shaping public view and manipulating rule results related to climate change in Punjab, Pakistan.

3. THEORETICAL FRAMEWORK

This study is built on the foundations of the Social Amplification of Risk Framework (SARF) and the Social Cognitive Theory (SCT). As per SARF, risk-related information, like that concerning climate change, which travels through social media may exaggerate or downplay the truth, depending on the people's response to it. The theories describe how influences upon the viewer have the cascading effect of how they think-and-feel to what they see as well as hear and learn from others. So when climate change activists or social media influencers advocate for the issue, they necessarily affect others in bringing them to act and have closer concern for the issue involved. This study uses these theories to examine how Punjabi social media message on climate change is further watered down to buoy more people on board with the cause.

4. MATERIALS AND METHODS

This study employed a mixed-methods design to investigate the ways in which social media helps to increase public awareness and promote engagement with environmental change issues in Punjab, Pakistan.

4.1 Quantitative Approach

Data from an example of opportuneness was collected through a web-based, cross-sectional study. Google Forms was used to create the survey in English, and WhatsApp was used to distribute it among different academic communities. It was comprised of 17 close ended questions. Sample of the study was (n=233) respondents who filled the questionnaire on the basis of available and convenient sampling technique.

4.2 Measures

Demographic: Age, sex, level of education, and job were noted.

Use of Social Media: Preferred and Frequency of use were measured Knowledge and Perception of Climate Change. The respondents again asked about their perception and understanding of climate change.

The role of Social Media: The perceived usefulness of social media to raise awareness and motivate planning with climate-related issues was tested.

Impact and Actions Taken: This is the effect of social media on the participant knowledge of environment change and any action taken as a consequence of exposure to related content.

4.3 Data Analysis

Descriptive and inferential statistics were used to interpret survey responses. The responses gathered from the interviews were examined using thematic analysis.

4.4 Qualitative Approach

In order to supplement the survey results, information was gathered during this phase from recorded interviews with policymakers, environmental influencers, and social media influencers. These interviews were gathered in order to document individual experiences, actions taken to reach a large audience, and difficulties faced when attempting to use social media to increase public awareness of climate change.

5. RESULT

The study's findings show a direct correlation between Punjab, Pakistan's social media activity and awareness of climate change. Higher levels of awareness were shown by participants who frequently interacted with online content about climate change, and interactions with social media influencers seemed to promote more public involvement. Additionally, the data indicates that audience engagement

may be influenced by the format and style of shared content, and that social media platforms themselves may indirectly impact climate change policy discussions.

Table 1: *Correlation among Social Media Usage and Environment Change Consciousness*

	Environment Change Consciousness	**Social Media Use**
Environment Change Consciousness	1	
Social Media Use	0.75**	1

Correlation is important at the 0.01 level (2-tailed).

According to this analysis, there is a strong positive correlation ($r = 0.75$, $p < 0.01$) between the frequency of social media use and environmental change consciousness. To put it another way, those who use social media more frequently are probably more conscious of environmental change issues.

Table 2: *Results of Direct and Indirect Effects*

Hypotheses Path	***β***	***SD***	***t***	***Sig.***
Exposure to climate change content -> Public awareness	0.42	.247	6.23	.000
ngagement with social media influencers -> Public participation	0.35	.124	4.56	.03
Type of content -> Public engagement	0.28	0.082	3.92	.000
Social media platforms -> Policy decisions	0.40	0.138	5.17	.000

According to the findings, social media contact with environmental change content greatly raises public awareness ($\beta = 0.42$, $t = 6.23$, $p < 0.001$), indicating that social media can be a useful tool for raising awareness of climate change. Engaging with social mass media influencers has a positive impact on public participation as well (= 0.35, = 4.56, p = 0.05), highlighting the influence of social media influencers in influencing public opinion. Moreover, the nature of the gratified that is posted on social media influences audiences engagement (= 0.28, t = 3.92, p = 0.001), which suggests some types of content are more likely to foster audience engagement. Finally, the policy decisions about climate change are affected by the stage of social media (0.40, t = 5.17, p = 0.001), which means that the stage of social media might play an important role in the decision-making process.

This article provides proof that social media is essential for raising awareness and encouraging involvement in environmental change. The results indicate that contact to environment change satisfied on social media, public awareness, engagement with social media influencers and public participation are influenced by the type of gratified communal on social media. Additionally, social media phases influence significantly the policy selection related to environment change. The findings can be used by policy makers, social media influencers, and environmental change agents who want to encourage people to learn about and take action on climate change.

5.1 Qualitative Results

Social media influencers and policymakers in Pakistan have increasingly recognized the power of digital platforms in shaping public discourse on climate change. Abbasi, an educator-turned-activist, highlighted this when he remarked,

> *"This is the real use of social media. Through my social media, I have created a following of like-minded people and together we can drive this social change."*

He further cautioned that

> *"If a collective action to preserve the environment is not taken, then in a few years, there will be no water, there will be mountains of trash everywhere and a concrete jungle."*

His observations highlight the ways in which influencers not only sway public opinion but also present climate change as a pressing social issue that calls for cooperation.

Similarly, young climate activist Zainab Waheed emphasised the importance of community leadership, especially by women, in tackling environmental issues. She said in the interview.

> *"I am a firm believer in the power of people, especially young women, to drive change where governments and institutions fail to do so,"*

She also thought back on her early participation in community-based projects like awareness campaigns, plantation drives, and student involvement. According to her story, social media can strengthen grassroots activism and generate momentum in areas where institutional responses are still scarce.

The importance of social media in climate advocacy is further supported by institutional viewpoints. Associate Research Fellow Zainab Naeem stressed at the SDPI seminar Tweet4Climate: Role of Social Media for Climate Advocacy in Pakistan that social media platforms should be used for climate education and awareness because of their rapidly growing influence. In support of this, SDPI Executive Director Dr. Abid Qaiyum Suleri said,

> *"The power of social media and its ability to curb climate change were the topics of the seminar."*

These are testimonies to how digital platforms are increasingly viewed as integral to Pakistan's more integrated environmental communication plans.

In terms of policymaking, public awareness and climate action are being coordinated by Punjabi provincial leaders. A right that can be achieved by raising people's awareness and working together is environmental protection, says Raja Jahangir Anwar, secretary of the environment and climate change at the government of Punjab. To mitigate the threats of climate change, he stressed the importance of creating awareness among people regarding actions such as tree planting. Moreover, he has remained an active part of the formulation and implementation of Punjab Climate Change Policy and Action Plan 2024. Senior Minister Marriyum Aurangzeb reviewed Punjab's first Climate Change Action Plan on July 31, 2024, and made the following assertion:

> *"The Punjab Climate Change Policy and the Climate Change Action Plan will be revolutionary in the fight against environmental pollution."*

She said the policy would deal with problems such as smog, increasing temperatures, and floods and outline the responsibility of all the stakeholders.

Other policymakers have also been expressing urgency. The Punjab Planning and Development Board chairman, Iftikhar Ali Sahoo, highlighted at the Policy Dialogue on Climate Change: Resilience and Financing in November 2023;

> *"We ought to act right now to stop this problem. In order to develop specific policies that would be beneficial for lowering environmental challenges at the operational level, we are getting in touch with all relevant environmental stakeholders."*

Smog in Lahore, erratic rains, droughts, floods, and pests invasion are the glaring examples that climate change had adversely affected daily life manifested upon the landscape of the country," noted Tamboli. In addition, at the International Solar Power Conclave 2025 Chief Punjab Governor Colonel (Retired) Sardar Saleem Haider Khan discussed the potential of renewable energy while remarking:

> *"The greatest energy source for preserving the environment and protecting Pakistan from natural disasters is solar power."*

He also highlighted the importance of government support for local green manufacturing and solarisation as part of sustainable climate solutions.

Together, these insights reveal that Pakistani policy and opinion elites share the understanding that advocacy, policy, and awareness need to be linked. The situation is particularly visible in Punjab, when climate vulnerability us very high and social media not only acts as a force multiplier to the institutional action of climate but also unlocks local energy for solidarity transmission.

6. DISCUSSION

The results of this study provide strong evidence that social media plays a significant role in raising awareness of and participation in environmental change in Punjab, Pakistan. The results of the correlation analysis showed a strong positive relationship between social media use and environment change consciousness, which may suggest that a higher degree of environment change consciousness is associated with a higher level of social media use. The outcome coincides with the prior studies focusing on the potential of using social media as an environmental awareness and engagement tool (Williams et al., 2015; Anderson, 2017).

All the four hypotheses were supported by the results of the direct and indirect effects analysis, which showed that contact to environment change satisfied on social media enhances public awareness, engagement with social media influencers enhances public participation, the type of relaxed common on social media influences policy choices related to environment change, and the social media stage has a significant impact on policy choices related to environment change. These responses hypothesise that social media may be a real means of promoting climate change awareness and participation, that social media influencers and content category may demonstrate a significant part in determining how people conduct and policy discourse.

There are the inferences of the study on the policymakers, influencers of social mass media and those who promote the need to change the environment to make people aware of climate change and be involved. The study also demonstrates that policymakers should include social media in their communication strategies on climate change. The study focusses on social media influencers, who may have a significant impact on community behaviour and climate change discourse. The study is among the proof that environmental activists have that social media is a powerful instrument for increasing participation and awareness of climate change.

7. CONCLUSION

This study offers proof that social media plays a significant part in raising awareness of and participation in environmental change in Punjab, Pakistan. The research confirms that exposure to climate change content on social media increases the public awareness; engagement with social media influencers promotes involvement of the public and type of communication on social media by influences public participation. In addition, environmental change policy-making is now heavily affected by social media. These findings should be considered by policymakers, social media influencers and environmental activists for generating climate change engagement and awareness.

The results of the study highlighted the opportunity that social media presents as a means to raise awareness of environmental issues and propose that social media platforms play a role in garnering public opinion and dissertations for programmatic change around the environment. Thus, social media use should be integrated as part of climate change communication in the case of policymakers, social media influencers and climate change advocates.

The study's focus on a particular region (Punjab, Pakistan) and the use of a convenience sample are among its limitations. Replicating the results in different populations and geographical areas should be the goal of future research. Future research could also delve deeper into the role that social media plays in promoting climate change awareness and participation, taking into account the influence of social media influencers as well as the effects of various content types.

All things considered, this study shows that social media can effectively raise awareness and engagement about climate change. What's more, it highlights the significance of integrating social media into environmental communication strategies.

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