

Engaging the grassroots NGO Communication Strategies for Climate Change Adaptation

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Abstracts

This study investigates the effectiveness of NGO communication strategies in developing climate change awareness and fostering engagement among communities in Western India especially Surat, India. The rationale behind this research stems from the necessity to understand and improve climate change communication given Surat's diverse socio-cultural landscape. We used a mixed-methods approach combining quantitative chi-square tests along with qualitative interviews to gather comprehensive understandings.

The quantitative part of this research study comprised a sample size of 400 participants, which indicates the strong relation between the frequency of meeting NGO campaigns and enhancing community understanding of the challenges of climate change (Pearson Chi-Square value = 28.714 and $p = 0.026$). The study also identified significant challenges faced by NGOs, such as public ignorance and differences in public opinion (Pearson Chi-Square = 30.536, $p = 0.015$). Locally tailored communication strategies were shown to be remarkably effective in raising climate change awareness and increasing participation in the community (Pearson Chi-Square = 31.422, $p = 0.012$). Further qualitative interviews supported these findings by emphasising on the importance of community empowerment, practical knowledge, and strategic partnerships. The study further emphasises the need of context-specific and culturally sensitive communication strategies in building climate resilience. These studies offer empirical insights into non-governmental organisations (NGOs).

Introduction

Climate change poses various challenges not only nationally but at a global level which is further affecting both human societies and the environment. Communities in cities like Surat face a high risk of health and other impact of climate change. Here, NGOs play a vital role in eliminating or reducing these risks by disseminating information and raising awareness. NGOs adopt various mitigating measures at the grassroots level (Firliandoko et al., 2022). The study of Burkšienė and Dvorak (2024) reveals that limited research on communication management creates misunderstanding regarding its potential to provide networking opportunities and negatively impacts general e-communication practices. Therefore, climate communication provides a valuable outline for transformational learning experiences which provides similar

emphasis on the cultural interpretation of climate change and practice of collaborative efforts and project-based communication towards climate change (Doyle et al., 2024). Climate educators need to correct existing misconceptions before presenting climate change issues through the lens of science and their impact on livelihoods. Connecting climate change to rural livelihoods resonated more effectively with people than scientific explanations. Thus it was crucial to employ a strategy that guided communities to acknowledge the necessity for adaptive behaviour through both the individual and collective sense-making (Adobor, 2024).

However, the efficacy of NGO communication strategies in Surat and the challenges they encounter remain underexplored. While existing literature provides valuable insights into general communication strategies and challenges in climate change adaptation there is a noted research gap with specific context to Surat. The socio-economic and cultural dynamics of Surat necessitate a focused investigation into how tailored communication strategies can improve awareness against climate change and bring engagement of the community at the grassroots level. Furthermore, empirical assessments of the effectiveness of these strategies and the specific barriers faced by the NGOs in this region are lacking.

Objective 1

To identify communication strategies that NGOs in Surat employ for raising awareness against climate change

Objective 2

To investigate the challenges faced by NGOs in their communication strategies and engagement efforts

Objective 3

To provide insights into the prominence of tailored communication strategies with special respect to local contexts

Review of Literature

Communication Strategies Employed by NGOs in Raising Climate Change Awareness

Effective communication is crucial for NGOs that are working to raise awareness about climate change; research highlights that NGOs apply numerous strategies like learning workshops, community engagements, social media campaigns, and associating with local leaders as partners to disseminate information and engage with the public (Selin & Chevez, 1995). These strategies are tailored in the local context to ensure relevance and effectiveness, like NGOs often employ storytelling, and local narratives to make climate change impacts more relatable and understandable (Moser, 2017). Additionally, participatory activities and visual aids are

often used for retention of information and to enhance engagement as well (Cox, 2010). Studies have shown that integrating local information and practices into communication strategies can significantly enhance the acceptance and credibility of climate change information (Adger et al., 2013).

NGO communication strategies play a vital role in engaging grassroots communities for climate change adaptation, particularly in regions like Surat. Effective communication must be legitimate, credible, and salient to foster climate adaptations and actions (Guida & Howarth, 2022). By targeting elementary school children, the Climate Smart Generation (CSG) demonstrates a successful approach with mixed learning methods to achieve its psychomotor, affective, and cognitive goals (Firliandoko et al., 2022). Behavioral science insights suggest that to overcome psychological and social barriers, it is essential to motivate individuals to inculcate sustainable practices that can be achieved through tailored communication strategies, which consider social influences and cognitive biases (Zaval & Cornwell, 2017). Communication networks are also vital as they help to manage the adverse outcomes of climate change, by improving the human-technology interface as we can see in various case studies of extreme weather events (Zimmerman, 2017). NGOs often frame climate change within the broader framework of sustainable development goals (SDGs) which can shape public opinion and foster engagement. Effective communication among stakeholders is crucial to identifying problems, raising awareness, and bringing behavioural change which is particularly important in the global south where livelihoods are heavily impacted by climate change (Swathi Lekshmi, 2012). Thus, NGO communication strategies in Surat must be context-specific, focused group-oriented, multifaceted, and adaptive to effectively engage grassroots communities in climate change adaptation.

Challenges Faced by NGOs in Communication and Engagement

NGOs face several challenges in their communication and engagement efforts. One of the significant challenges is the lack of proper resources including funding and skilled personnel which limits the quality and reach of their communication activities (Brown & Kalegaonkar, 2002). Another significant challenge is overcoming skepticism and public apathy towards climate change often fuelled by misinformation and conflicting interests (Nisbet, 2009). Cultural and linguistic diversity in regions like Surat also poses a challenge requiring NGOs, to adapt their messages to different languages and cultural norms (Schlosberg, Collins, & Niemeyer, 2017). Additionally, political and economic factors can hinder the efforts of NGOs,

as they may face resistance from industries or local authorities that are being benefited from the status quo (Jamison, 2010).

NGOs in Surat face several key challenges while implementing various communication strategies for climate change adaptation. One of the significant challenges is the complexity of effectively reaching diverse audiences with varying levels of understanding and perspectives about the risks associated with climate and adaptation needs. This requires NGOs to develop both amplifying and attainable communication strategies to address different audience segments simultaneously (Cox & Schwarze, 2022). The lack of scientific assessments and inadequate documentation of “Indigenous and Local Knowledge (ILK)” systems also pose obstacles in promoting and diffusing potential ILK-based adaptation practices (Rahman, 2021). To overcome these challenges NGOs must adopt a more dialogue-oriented approach for communication and engagement with communities in ways that acknowledge and integrate local knowledge and practices. This can be facilitated through platforms like community radio which can bridge communication gaps and connect local issues with broader stakeholder networks (Rödder, 2020).

Significance of Tailored Communication Strategies

Tailored communication strategies play significant role in fostering climate change adaptation and effectively engaging the local communities. This approach involves customized communications to fit specific criteria and curtail the needs of diverse segments (Noar et al., 2007). Studies indicate that tailored communication strategies can lead to increased trust, better understanding, and a higher level of engagement which can further bring behavioral change in the communities (Kreuter & Wray, 2003).

NGOs in Surat are utilizing various digital and social media platforms in implementation of communication strategies and climate change adaptation. These platforms provide means to raise awareness, engage with the public, and influence policy decision-making. Social media platforms like Instagram, Facebook, YouTube, and Twitter facilitate NGOs to share updates, foster dialogues and run campaigns for climate change which are essential to strengthening communication and achieving the goals of the organization (Janssen & Chaudhri, 2018). Web-based platforms also help in disseminating accurate and timely information which is crucial in designing, implementing, and adapting informed decision-making (Karali & Mattern, 2017). NGOs based in Surat city can assess the impact of their “digital communication strategies” by analysing engagement metrics such as likes, comments, and shares and further on the reach of

their post as well as monitoring changes in policy debates and public perception for climate change (Vu et al., 2020; Pearce et al., 2019). Moreover, strategic planning and evaluation based on formative research can help in refining these communication efforts to ensure their effectiveness and alignment with the goals of NGOs (Tasente, 2023).

As per the recent research study by Burkšienė and Dvorak (2024), limited comprehension of communication management negatively impacts common e-communication practices and later leads to misunderstanding of its potential to help in effective networking and collaborative efforts. Climate communication offers a valued framework for transformational learning experiences, emphasising on cultural interpretation of climate change and the practice of participatory communicative action (Doyle et al., 2024). Climate educators need to first correct prevailing misconceptions before presenting the issue of climate change from the eye of science and their effect on livelihoods. Climate change when linked to rural livelihood drew more attention from public compared to scientific explanations. Therefore, it is important to employ a policy that guides the community to consider the necessity of adaptive behaviour through individual and collective sense-making (Adobor, 2024).

Methodology

Sampling and Data Collection

To examine the effectiveness of NGO communication strategies in raising climate change awareness and engagement in Surat we employed an infinite population sampling technique to determine the sample size. Based on this technique the required sample size was calculated to be 384 respondents (Cochran, 1977). To ensure a robust dataset we circulated more than 10 percent additional survey questionnaires resulting in a total distribution of 476 forms. The survey comprised six questions formulated using a Likert scale of 5 points, aimed at measuring various aspects of climate change awareness and engagement.

The sample was collected solely from Surat targeting schools, colleges, universities, institutes, and public places, after cleaning of data to remove incomplete or inconsistent responses, 400 valid samples were selected for further study. A chi-square test was employed to study three proposed hypotheses concerning the relationship between NGO communication strategies and community awareness of climate change impacts.

Survey Questions

The questions used during the survey are provided as follows for the better understanding of the research:

NGO Influence question: On a scale from 1 to 5, with 1 being "Never" and 5 being "Very Often," How often do you come across NGO campaigns related to climate change? (Objective: Gauge respondents' overall awareness levels.)

Impact of NGO levels questions: I have become more aware of climate change impacts due to NGO campaigns. The options are: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

Engagement level question: How often do you engage with or participate in NGO campaigns related to climate change in Surat? On a scale from 1 to 5, with 1 being "Never" and 5 being "Very Often,".

Challenges level question: To what extent do you agree that NGOs face significant challenges in effectively communicating climate change information in Surat? The options are: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

Awareness question: How often do you encounter locally tailored NGO campaigns about climate change in Surat? The options are: Very Often, Often, Sometimes, Rarely, and Never.

Awareness level question: To what extent do you agree that locally tailored NGO campaigns have increased your awareness and engagement with climate change issues? The options are: Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

Qualitative Data Collection

For the qualitative factor, we distributed 30 open-ended questionnaires among NGOs, activists, and founding members involved in climate change initiatives in Surat. The selection criterion for NGOs was based on their activity level and a minimum of four years of experience in climate change initiatives. The list of NGOs is 'Project Surat', Surat Van, Innovate4india Development Forum, and Akkrishyam Recyclers. The respondents who represented the NGOs were the people who were responsible for managing the media affairs in their respective organizations. Out of the 30 questionnaires circulated 18 responses were collected and analyzed. Thematic analysis was conducted to extract key themes and insights from the open-ended responses which were further discussed concerning the theoretical frameworks, including transformative communication principles, strategic communication approaches, and participatory communication theory.

Data Analysis

The quantitative data was analyzed using chi-square tests to validate the hypotheses. The following hypotheses were tested:

1. Hypothesis 1

There is a significant relation between the frequency of exposure to NGO campaigns related to climate change and the level of awareness among individuals regarding the impact of climate change.

2. Hypothesis 2

NGOs face various challenges in effectively disseminating information regarding the issue of climate change.

3. Hypothesis 3

Locally tailored communication strategies used by NGOs play a significant role in bringing awareness and engagement among local communities regarding climate change.

For the qualitative analysis, thematic analysis was employed to identify and interpret patterns and themes within the collected responses. This involved coding the data and aligning the findings with established theoretical frameworks such as participatory communication theory (Fourie, 1970), transformative communication principles (Servaes, 1999), and strategic communication approaches (Hallahan, Holtzhausen, van Ruler, Verčič, & Sriramesh, 2007).

Chi-Square Tests Exposure to NGO Campaigns * Awareness of Climate Change Impacts due to NGO Campaigns

Table:1

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.714 ^a	16	.026
Likelihood Ratio	28.659	16	.026
N of Valid Cases	400		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 5.15.

Null Hypothesis (H0): There is no significant relationship between the frequency of exposure and NGO campaigns related to climate change and the level of awareness of climate change impacts among individuals.

Alternative Hypothesis (H1): There is a significant relation between the frequency of exposure to NGO campaigns related to climate change and the level of awareness of climate change impacts among individuals.

The chi-square tests provide statistical evidence on the relationship between the frequency of encountering NGO campaigns related to climate change and community awareness of climate change impacts. The Pearson Chi-Square value is 28.714 with 16 degrees of freedom and an asymptotic significance of 0.026. Since the p-value (0.026) is less than the commonly used significance level of 0.05, we reject the null hypothesis.

Similarly, the Likelihood Ratio test yields a chi-square value of 28.659 with 16 degrees of freedom; and an asymptotic significance of 0.026. This p-value is also less than 0.05 further supporting the rejection of the null hypothesis.

Chi-Square Tests Challenges Faced by NGOs in Communication Efforts * Change in Community Awareness			
Table:2			
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.536 ^a	16	.015
Likelihood Ratio	31.141	16	.013
N of Valid Cases	400		
a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 8.69.			

Null Hypothesis (H0) NGOs do not face significant challenges in effectively communicating climate change information to the community.

Alternative Hypothesis (H1) NGOs face significant challenges in effectively communicating climate change information to the community.

Interpretation

The Chi-Square test results show a Pearson Chi-Square value of 30.536 with 16 degrees of freedom and a significance level (p-value) of 0.015. Similarly, the Likelihood Ratio value is 31.141 with 16 degrees of freedom and a significance level of 0.013.

Based on the Chi-Square test results, we reject the null hypothesis (H0) and accept the alternative hypothesis (H1). This indicates that NGOs do face significant challenges in effectively communicating climate change information to the community.

Chi-Square Tests Locally Tailored Communication Strategies by NGOs * Climate Change Awareness and Engagement among Local Communities			
Table:3			
	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31.422 ^a	16	.012
Likelihood Ratio	31.996	16	.010
N of Valid Cases	400		
a. 2 cells (8.0%) have expected count less than 5. The minimum expected count is 4.76.			

Null Hypothesis (H0): There is no significant difference in the effectiveness of locally tailored communication strategies on climate change awareness and engagement among local communities.

Alternative Hypothesis (H1): Locally tailored communication strategies by NGOs significantly enhance climate change awareness and engagement among local communities.

The chi-square test results reveal a statistically significant association between the variables ($\chi^2 = 31.422$, $df = 16$, $p = .012$), indicating a meaningful relationship between them. This significance is further supported by the Likelihood Ratio test ($\chi^2 = 31.996$, $df = 16$, $p = .010$).

Discussion

Consequently, we reject the null hypothesis, confirming an important link between the variables. Therefore, tailored communication strategies by NGOs are more effective in raising awareness and engagement on climate change issues among local communities when contextualized to the local environment.

The results from the chi-square tests provide valuable insights into the effectiveness of NGO communication strategies in addressing climate change awareness and engagement, as well as the challenges faced by NGOs in this endeavour.

Table: 1, illustrates a significant association between the frequency of exposure to NGO campaigns related to climate change and the level of awareness among individuals regarding the impact of climate change. Thus, the results confirm our first objective, showing that awareness regarding climate change has been enhanced by NGOs' communication strategies. Rejecting the null hypothesis, the study confirms that campaigns by NGOs are positively correlated with awareness of climate change, underlining the significance of proactive communication initiatives while tackling this global concern.

Coming to the **Table: 2**, the findings of chi-square test indicate that NGOs face a great deal of difficulty while disseminating information regarding climate change. This result is associated with the second objective of the study which shows that despite continuous efforts to raise awareness amongst the community, NGOs still face obstacles in the process of their effective communication and engagement efforts. The study by rejecting the null hypothesis, highlight the importance of tailored communication strategies to overcome the existing challenges, which further emphasize the effectiveness of climate change communication initiatives.

Coming to **Table: 3**, finally shows that there is a significant correlation between the efficacy of tailored communication strategy and awareness and engagement regarding climate change among local communities. This result corresponds to the third objective of this study signifying that tailored communication strategies have a greater impact in fostering awareness of climate change and engagement at the grassroots level. By rejecting the null hypothesis, we affirm the importance of context-specific approaches in communicating climate change information, emphasizing the need for NGOs to adapt their strategies to local contexts to maximize their effectiveness.

Collectively, these findings highlight the critical role of NGOs in climate change communication and adaptation efforts. By adapting the tailored communication strategies and addressing the identified challenges, NGOs can enhance community awareness, and engagement, and ultimately contribute to building resilience to climate change impacts in vulnerable regions like Surat, India.

Open-ended Question Discussion

Akash Bansal founder of Project Surat organisation confronts that social media especially Instagram plays an important role in spreading awareness amongst the community of Surat. People are coming at single platform to clear the Tapi River because now the people are more informed, educated and have become more responsible because of our various campaigns like Tapi Uturn, Tapi Sanrakshan, and Tapi 21K. Tailored communication strategy also plays vital role when it comes to changing the perception of people and bringing a positive change in our society says Akash Bansal.

Another organisation i.e., Surat Van which aims to cultivate forest in urban area across Surat City. Lulua Hussain from Surat Van says that the aim of the organisation is greener Surat. The organisation uses locally tailored communication strategy to communicate and spread awareness among communities. Recently the organisation has launched its podcast channel named “The Green Pod - A Surat Van Sustainability Podcast” to communicate and connect with the environment volunteers.

Hardiikk Gurav from Akkrishyam Recyclers says that we face many challenges while communicating with the community but communication strategy plays a critical role in creating awareness in the society. Taking sessions at various levels like recently we went to SMC Althan Shelter home to aware the students about E-waste under the campaign “Project Saksharta”. The problem lies more in the informal sector says Hardik Gaurav. Akkrishyam Recyclers recognized by the Central Pollution Control Board (CPCB) is a Surat-based registered Producers Responsibility Organization (PRO). The organisation is responsible for the channelization of Waste Electrical and Electronics Equipment (WEEE). The company ensures that E-waste is recycled which further contributes to cleaner and greener Surat.

Shailly Bansal from Innovate4india Development forum says that recently their organisation launched a campaign named as “Surat-Plogathon” which was aimed at cleaner India and Fit India. To launch the campaign the organisation used social media platform and also offline platforms like billboards and small posters. As per the organisation report, “Surat generates a staggering 20,000 kg of plastic waste daily, with much of it ending up unaccounted for in our streets and rivers.” Due to the huge waste, the city is at high health risk because of river pollution. Therefore, the strategic communication here is playing a vital role to aware the citizens says Shailly Bansal.

In the dynamic, landscape of Surat, where diversity thrives understanding the elaborate array of local demographics is paramount, and different areas embrace unique populations with distinct, perspectives on climate change. Tailoring communication strategies to accommodate these diverse cultural and linguistic preferences is not just a matter of convenience but a necessity for fostering meaningful engagement.

Altruism and Community Empowerment

An activist; keenly emphasized the imperative of altruism in climate change activities stating "the cause must transcend personal interests and focus on the collective well-being". This sentiment echoes the ethos of many NGOs, which often operate on the principles of selflessness, and community empowerment.

Challenges in Communication

Divya Kalra founder and director of Innovate4India stated, "A significant challenge that NGOs, face when communicating about climate change in Surat is the pervasiveness, lack of awareness and knowledge among the public, many individuals are unaware of the severity of climate change and its impact on their lives making it challenging for NGOs, to garner interest and engagement. Another challenge is the lack of interest among the public.

Government Support

Another stakeholder emphasized the fundamental, role of local government, and support in climate change initiatives, all these together indicate that collaboration with municipal authorities is indispensable, for long-term success. This viewpoint emphasizes the significance of fostering synergies between NGOs, and governmental bodies to achieve sustainable outcomes; one worker asserted that "the most impactful communication campaign that raised my awareness about climate change, was a 'citywide plogathon' organized by a local NGO. The event not only highlighted the issue of waste management but also encouraged the participation of the community at the local level in cleaning up the city while educating participants about the environmental implications of littering."

Theoretical Framework and Insights

In the context of the theoretical framework outlined earlier, these insights offer valuable contributions to our understanding of climate change communication, the emphasis on cultural sensitivity and inclusivity aligns with theories of participatory communication, advocating for the active engagement of communities in shaping communication processes.

Additionally, the emphasis on feasibility; and collaboration highlights the importance of approaches to strategic communication accounting for the practical limitations and opportunities inherent in local contexts; this echoes strategic communication theories which advocate for aligning communication objectives with broader organizational goals and the needs of stakeholders. Overall the insights gathered from the perspectives of local stakeholders, provide valuable guidance for NGOs, seeking to enhance their climate change communication strategies in Surat. By incorporating these insights into their strategies, NGOs can foster more meaningful engagement within the local communities and drive shared action towards climate resilience and sustainability.

Conclusion

In addressing the complexities of climate change communication in Surat, India the study employed a multifaceted approach to collect and analyse the data. Initially, the study tested hypotheses through chi-square tests to understand the statistical relationships between community awareness and NGO communication strategies. To further deepen our insights, we conducted interviews with activists, volunteers, NGO members, and community stakeholders. This comprehensive approach allowed the researcher to incorporate quantitative data with qualitative insights providing a holistic understanding of the subject matter.

The chi-square test results indicated a significant relation between the frequency of communication, NGO campaigns, and the level of awareness regarding climate change impacts among individuals. The Pearson Chi-Square value of 28.714 with a p-value of 0.026, and the likelihood ratio test with a chi-square value of 28.659 and a p-value of 0.026 both support rejecting the null hypothesis. This confirms that increased exposure to NGO campaigns is correlated with higher levels of climate change awareness. Likewise, the results of the chi-square test signify the major challenges faced by NGOs with a Pearson Chi-square of 30.536 and a p-value of 0.015. Along with this there is also a likelihood of a p-value of 0.013 and ratio value of 31.141. These findings reflect the barriers and challenges faced by NGOs while disseminating information regarding climate change including public ignorance, skepticism, and differences of opinion amongst the community. Not only this, the result of chi-square test for tailored communication strategies shows substantial effectiveness with a Pearson Chi-square value of 31.422, and a p-value of 0.012 and likelihood value of 31.996, and another p-value of 0.010. This result emphasise the importance of a tailored communication strategy in bringing awareness related to climate change and engagement among local communities.

Interview gathered, provided deeper insights into the challenges faced by the NGOs while communicating about climate change in Surat. One of the stakeholders emphasised the importance of “collaboration with municipal authorities for long-term impact” like innovate4India Development Forum, Project Surat and Surat Van in collaboration with Surat Municipal Corporation are bringing positive change and increasing awareness amongst the local community of Surat regarding the climate change.

This study demonstrated the efficacy of regionally adapted communication strategies. Quotes collected from stakeholders emphasised the need of culturally relevant content, local languages, and community engagement in communication initiatives. The chi-square test findings showed that concentrated tactics dramatically increase climate change knowledge and involvement in local communities.

Ethical Statement

Participants were being provided with complete information and verbal consent before their participation in this study. The provided Google form was enclosed with an ethical statement regarding confidentiality, informed consent, the ability to withdraw, and usage of data. Participation was completely optional based on choice, with the ability to withdraw at any moment.

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