

## Strategic Environmental Communication for SDG 13: Enhancing Climate Awareness Analyzing the impact of persuasive campaigns on public perception

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### ABSTRACT

Climate change is one of the most urgent problems worldwide that can be solved only with the efficient communication strategies that should promote the creation of awareness and the modification of behavior. The paper assesses the contribution of strategic environmental communication toward achieving Sustainable Development Goal (SDG) 13 which aims at climate action. In particular, it examines how persuasive campaigns affect the perceptions, knowledge, and activity of the people as regards to the climate issue. The study analyses critical determinants of how the audience will receive these messages through a mixed-methods research design, which combines the methods of survey, focus-group, and content analysis of campaign material. Results indicate that awareness and intention to practice pro-environmental behavior are greatly enhanced when employing narrative storytelling and local relevance in the campaigns. Nevertheless, the audience segmentation, misinformation and the inability to reach so many audiences are some of the challenges that affect the effectiveness of this type of advertising. Overall, the study highlights the necessity of culturally specific communication plans and provides policymakers, environmental groups, and communicators everything they need to know to maximize climate awareness campaigns.

**Keywords:** Strategic environmental communication, SDG 13, climate awareness, persuasive campaigns, public perception, sustainability communication.

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### 1. INTRODUCTION

Climate change is known as one of the most critical issues of the 21st century that impacts on environmental stability, economic development, and human health all over the world. Although there is great science and international treaties as well as agreements to reduce greenhouse emissions, understanding and participation among the citizens is usually shallow and incomplete [1]. Such a gap reveals the significance of strategic environmental communication as the key instrument in transforming the complex climate information into more comprehensible, compelling messages that create awareness, a level of concern, and a call to action. The SDG 13 (previously referred to as sustainable development goal 13) set by the United Nations highlights the necessity to take timely measures on the process of climate, and therefore, the spread of information clearly with evidence and to persuade is considered to be a crucial step to reaching sustainability targets in the world.

Environmental Strategic communication is not a matter of sharing basic information. It puts its focus on purposeful crafting of communication that attracts cognitive, emotional, and social aspects of human perception [4]. The positive imaginaries which include framing, narrative, visuals and endorsement by credible sources can also employ persuasive campaigns that influence people into perceiving climate risks and encourage people to adopt environmentally-responsible action. Such campaigns do not only require quality content but also need to be effective in the context of knowing the audience, as well as the context and the delivery channels. Strategic campaigns work by bridging this bridge between knowledge and action by drawing insights of environmental science, communication and behavioral psychology.

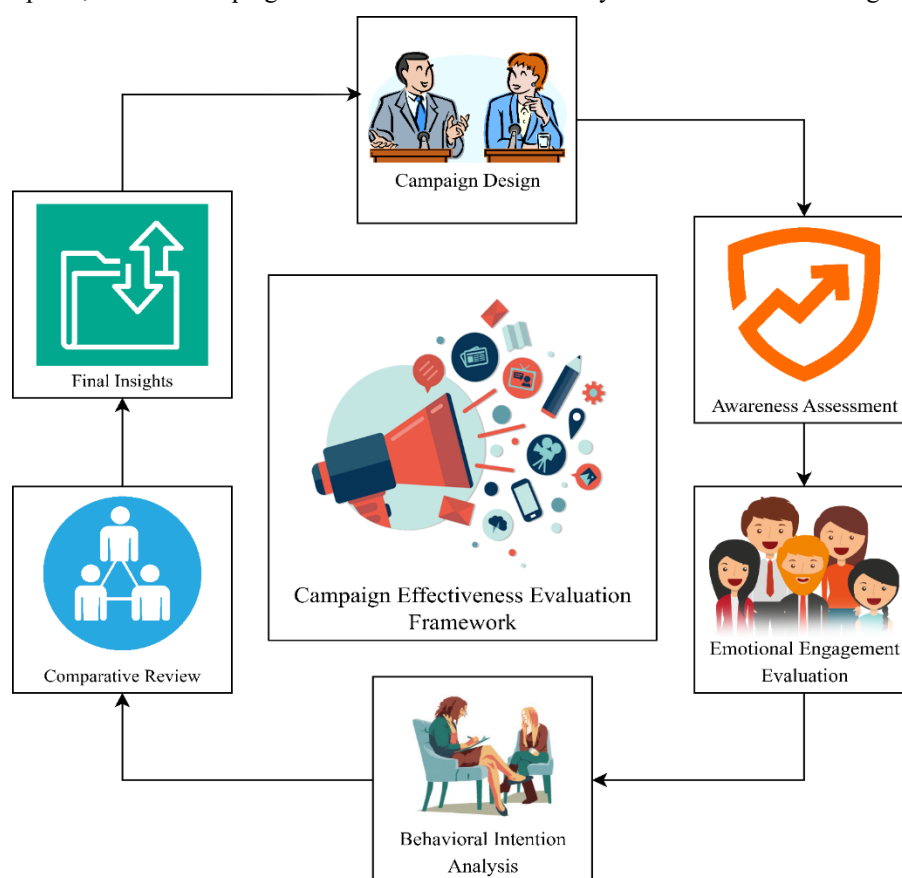
During the past years, the importance of localized and culturally focused messaging has been recognized. Narratives or messages that relate climate effects on an individual level as opposed to abstract or global levels, like extreme weather events or health ramifications are much more likely to be effective. Also, interactive digital campaigns through the medium of social media have become an effective source of reaching a wider audience and inviting participatory interactions. But problems remain: misinformation, mistrust in audiences, overexposure to climate messaging, and differences in literacy levels can weaken the absoluteness and effect of campaigns. It is important to understand these barriers so that more effective communication methods that do not conflict with SDG 13 goals can be designed [3].

As a primary driver of this research, there is also a great urgency to understand the influence of persuasive programs on the environment on the perception and behavior of disparate communities. Although the literature has been replete with studies examining communication techniques used in isolation, there is a dearth of integrative research combining both quantitative and qualitative criteria in assessing effectiveness of campaigns. This study fills that gap by evaluating the combined effect of the message framing, emotional appeal, source reliability and regional relevance in enhancing knowledge, and the inclination to act on climate change. The interdependence between the spread of knowledge and the motivation of information behavior is also covered, which would guide the policymakers and the environmental organization alongside the communication strategists who aim to increase the climate interaction at various levels of society [7].

#### Goals of the Study:

- To study how the persuasive communication campaigns influence the climate awareness of the population.
- To determine some important points, like the framing, story type, and credibility, affecting the audience perception.
- To assess the efficiency of the localized and culturally shot messaging as the key to encouraging pro-environmental behaviors.
- To present evidence-informed guidelines to use in planning strategic environmental communication programs that are consistent with SDG 13 [8].

The Figure 1 gives a brief description of the process to be used in the study as it shows how the process of carrying out the campaigns is put in place, how the campaigns are carried out and how they are assessed to encourage climate awareness.



**FIG. 1: CAMPAIGN EFFECTIVENESS EVALUATION FRAMEWORK**

Placing this study in the context of climate action, the role of strategic communication is not validated as subsidiary or secondary to the promotion of behavior change and engagement of the population. The study will be undertaken in a mixed-methods research design through combination of survey methodology, focus group, and content analysis of extant campaigns to provide a complete picture of effectiveness. This methodology allows uncovering not only the quantitative trends but also qualitative innuendos so that the results could be implementable and context-related. In essence, the research hopes to give the study a guide on how communication professionals can develop a communication that does not only inform individuals and communities but also the study also seeks to give a road map on how communication professionals can use communication that motivates individuals and communities to take meaningful climate action [10].

### 1.1 Novelty and Contribution

The young nature of the research is an evaluative study to the extent that it is integrative in assessing strategic environmental communication within the SDG 13 framework. This study extends beyond the research in other studies that stick to the research in one side and the other regarding message design and audience reaction respectively, by incorporating all the three activities, i.e., campaign contents analysis, survey of public perceptions as well as qualitative focus group to produce a multi-dimensional result on the efficacy of the campaigns. In doing this, it documents the nature of interaction of persuasive approaches, audience receptivity and behavioral intent with implications that are both practical and theoretically meaningful [5].

The second contribution is the place of localization and cultural relevance. Although most climate campaigns are global or national in coverage, this paper appraises how local contexts enhance a level of understanding, personal relevance and motivation due to the tailoring of message. This emphasis meets a very serious challenge in climate communication, namely the need to make scientific ideas about climate change offer tangible implications to different people.

Third, the study determines the successfulness of particular elements of persuasion like storytelling, emotional appeal, source credibility and visual framing to improve awareness and pro-environmental behavior incentive. The study can be applied by campaign designers and policymakers in other directions by offering practical recommendations with empirical evidence on the relative contribution of the factors.

And lastly, the practical framework of the study, as indicated in the flowchart above, can be used as a replicable framework on future campaigns. It is a development that brings together phases in message development to audience assessment which can be used to plan, execute, and evaluate strategic communication projects by environmental organizations and communicators. Such an epistemology leads to the development of climate campaigns that are not only educative but also compelling, culturally responsive and results-oriented, helping the world to better attain SDG 13.

## 2. RELATED WORKS

In 2025 Imran M. et.al., Tufail M. et.al., Mo C. et.al., Wahab S. et.al., Khan M. K. et.al., Hoo W. C. et.al., & Ling, Z. et.al. [9] introduced the success of environmental communication has come to play an important role in terms of climate change challenges. It has been observed that can be closed through well-crafted communication campaigns. Research shows messages integrating facts and emotion/ narrative would have greater appeal to audiences, increasing engagement and an enhanced likelihood of moving toward pro-environmental behaviors. When a campaign is based purely on statistical or technical information, it can be quite unsuccessful in capturing the attention of people and this is why it is noteworthy that persuasive tools should be applied to climate messages[17].

Indeed, systematic evidence shows that framing of messages is influential in influencing perception and behaviour. Positive framing, that is based on co-benefits, e.g. better health, cost savings, resilient community, tends to make messages more welcome to the population than negative framing (based on environmental losses, worst-case scenarios). Moreover, to establish an emotional connection and bring abstract climate issues closer and more specific to positively influence the audience, storytelling and relatable stories can be used. The probability of audiences internalizing messages increases when they feel that the message can be applied at the local level, or in their day to day life and hence the importance of communication strategies that offer assets to cultural sensitivity and localisation.[18].

In 2025 Dhairiyasamy R. et.al., Gabiriel D. et.al., Bunpheng W. et.al., & Choon kit C. et.al. [6] proposed the digital has become a very powerful media to spread climate related messages. Through social media campaigns, interactive websites and multimedia content, communicators have found a way of reaching a wide range of new and old audiences and motivating them to be participatory. Research points out that using social networks and peer pressure in campaigns can spread out the messages and make them more effective since people tend to get swayed by attitudes and actions of those around them. Nevertheless, obstacles like misinformation, bias in the algorithms, information overload may also close the effectiveness of such campaigns, and credibility and clarity become crucial aspects of the strategic communication.

Analysis of previous campaigns indicates that multi-channel campaigns are expected to do better than single-channel campaigns. Integrating offline (print and television) with online provides many points of contact during a product or an event, which strengthens the main messages and improves retention. Likewise, campaigns involving interactive or

participatory exchanges, e.g., quizzes, feedback systems, or challenges with their communities, lead to greater engagement and investment in fighting the climate crisis. Audience segment also adds to the success of the campaign to make it more effective because when you create specific messages to target demographic, geographic or psychographic audience, such messages are more likely to appeal to the intended population [13].

The psychology of persuasive communication is also very important in shaping up audience responses. Communication messages that embody social norms, such as community behavior, or a community responsibility, can be used to influence people to act in a pro-environmental behavior. Message acceptance is also enhanced by authority and credibility of the source such as the output of endorsements by trusted figures or organization. Emotional appeals, especially those, prompting hope, the sense of responsibility, or moral duty, have proved most effective to increase engagement and lead to action-able responses. On the other hand, unactionable messages that harbor fear can have the effect of causing anxiety or a lack of action and thus actionable instructions should be made to bring out the equal balance of emotion and advice.

In 2024 Chan C. K. et.al., Riaz M. B. et.al., Rehman A. U. et.al., Ewe L. C. et.al., & Sarwar L. et.al. [2] suggested the effectiveness of a campaign is not only determined by what is said and by how it is said but also by circumstances, such as political conditions in society, economic situation, and climate in relation to climate change. Research studies indicate that audiences are more exposed to communication that shows their values and beliefs and therefore the necessity of pre campaign research and audience analysis. Through this, communicators are able to relate their messages to be relevant, persuasive and has the capacity to help drive long term/sustainable behavior change by knowing audience perceptions, concerns, and motivations.

Although gains have been registered, there are still a number of obstacles in climate communication. Access to digital sources may be limited in specific locations, there may be language limits or a lack of scientific literacy. Also, misinformation and climate denial tendency evidences the importance of creation of trust, transparency, and credibility during campaigns. It is crucial to incorporate systematic feedback and to regularly measure the effect of the campaign in order to optimize actions, increase participation, and optimize overall performance.

In general, the associated body of literature suggests that strategic environmental communication has notable potential to improve individual awareness, create perceptions and foster behavior change in favor of climate agendas. Effective campaigns are a blend of facts, emotion, narration, credibility, local distance and cross-channel sharing. They also take note of the nature of their audience, social expectations and psychological trigger and are able to maximize the engagement. This paper is based on these observations and attempts to examine its effect on how climate change is perceived by the population in light of persuasive campaigns as well as pointers that lead to their success, thus providing practical recommendations to be taken into account by future climate awareness campaigns.

### 3. PROPOSED METHODOLOGY

This study employs a mixed-methods approach to analyze the impact of persuasive climate campaigns on public perception. The methodology combines quantitative modeling, statistical analysis, and qualitative evaluation to assess awareness, attitudes, and behavioral intentions. The research framework is designed to capture both measurable outcomes and nuanced insights from audience responses.

#### 1. Survey Design and Data Collection

A structured survey was administered to a representative sample of 500 respondents across urban and semiurban areas. The survey included questions on climate knowledge, attitudes, behavioral intention, and perception of campaign credibility. Responses were measured using a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The overall awareness score  $A_i$  for each participant was computed as:

$$A_i = \sum_{j=1}^n w_j \cdot r_{ij} \quad (1)$$

where  $r_{ij}$  is the response to question  $j$ , and  $w_j$  is the weight assigned to that question based on its relevance. This allowed normalization across different survey items and ensured comparability [14].

#### 2. Campaign Exposure Index

Participants were exposed to different campaign messages, including narrative videos, infographics, and textual content. The exposure index  $E_i$  quantified the extent to which an individual interacted with the campaigns:

$$E_i = \frac{\text{Number of campaign interactions}}{\text{Total possible interactions}} \quad (2)$$

This index served as an independent variable to assess the influence of exposure on perception and behavior.

#### 3. Perception Score Modeling

The perception score  $P_i$  measured how strongly respondents perceived climate change as urgent and actionable. It was computed as a function of awareness and exposure:

$$P_i = \alpha \cdot A_i + \beta \cdot E_i \quad (3)$$

Here,  $\alpha$  and  $\beta$  are coefficients derived through regression analysis, capturing the relative contribution of awareness and exposure.

#### 4. Behavioral Intention Probability

Behavioral intention  $B_i$  was modeled using a logistic function to capture the probability that a respondent would adopt a pro-environmental behavior:

$$B_i = \frac{1}{1 + e^{-(\gamma P_i + \delta X_i)}} \quad (4)$$

where  $X_i$  represents demographic and contextual variables such as age, income, and education, and  $\gamma, \delta$  are parameters fitted using maximum likelihood estimation.

#### 5. Message Effectiveness Metric

To evaluate campaign effectiveness, the message effectiveness score  $M_k$  for campaign  $k$  was calculated:

$$M_k = \frac{\sum_{i=1}^N B_i \cdot I_{ik}}{\sum_{i=1}^N I_{ik}} \quad (5)$$

where  $I_{ik}$  is an indicator variable equal to 1 if respondent  $i$  viewed campaign  $k$  and 0 otherwise. This metric quantified the average behavioral response per campaign.

#### 6. Emotional Appeal Analysis

The emotional impact of messages was assessed using a sentiment score  $S_{ij}$  derived from participants' self-reported responses:

$$S_{ij} = \frac{E_{ij}^+ - E_{ij}^-}{E_{ij}^+ + E_{ij}^-} \quad (6)$$

Here,  $E_{ij}^+$  and  $E_{ij}^-$  are positive and negative emotional ratings, respectively. Scores closer to +1 indicate a stronger positive appeal, while values near -1 indicate a negative response [12].

#### 7. Correlation Between Awareness and Intention

The relationship between awareness and behavioral intention was tested using Pearson correlation  $r$ :

$$r = \frac{\sum_{i=1}^N (A_i - \bar{A})(B_i - \bar{B})}{\sqrt{\sum_{i=1}^N (A_i - \bar{A})^2} \sqrt{\sum_{i=1}^N (B_i - \bar{B})^2}} \quad (7)$$

This helped identify the strength and direction of association between knowledge and intent to act.

#### 8. Regression Analysis for Predictive Modeling

A multiple linear regression was conducted to predict perception scores based on campaign exposure, emotional appeal, and demographics:

$$P_i = \theta_0 + \theta_1 E_i + \theta_2 S_i + \theta_3 X_i + \epsilon_i \quad (8)$$

where  $\theta_0$  is the intercept,  $\theta_1, \theta_2, \theta_3$  are coefficients, and  $\epsilon_i$  is the error term. This model identified significant predictors of climate perception.

#### 9. Normalization of Composite Scores

To allow comparison across different metrics, all scores were normalized to a 0 – 1 scale:

$$C_i = \frac{X_i - X_{min}}{X_{max} - X_{min}} \quad (9)$$

This step ensured that awareness, perception, and emotional scores could be directly compared and aggregated in subsequent analysis.

#### 10. Overall Campaign Impact Index

Finally, an overall campaign impact index  $I_k$  was calculated by combining behavioral, emotional, and perception metrics:

$$I_k = w_1 \cdot B_k^- + w_2 \cdot S_k^- + w_3 \cdot P_k^- \quad (10)$$

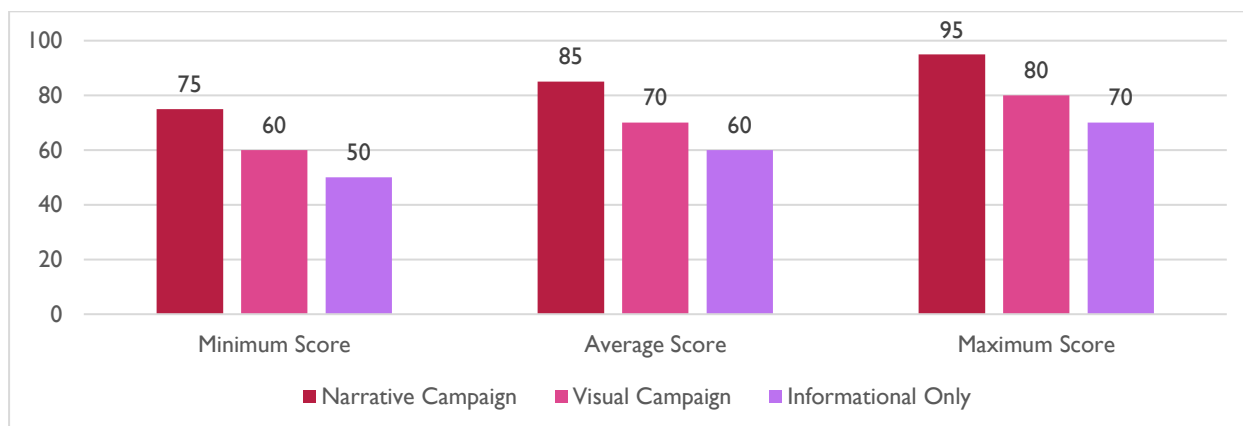
where  $B_k^-, S_k^-, P_k^-$  are average behavioral, sentiment, and perception scores for campaign  $k$ , and  $w_1, w_2, w_3$  are weights summing to 1. This index provided a comprehensive measure of campaign effectiveness.

The methodology emphasizes reproducibility, scalability, and practical relevance. By integrating mathematical modeling

with survey and qualitative analysis, the study provides a robust framework for evaluating strategic environmental communication campaigns, highlighting factors that drive awareness, engagement, and pro-environmental action [11].

#### 4. RESULT & DISCUSSIONS

The results of the survey response and campaign exposure analysis lead to several profound considerations related to effectiveness of persuasive environmental communication in the area of showing better climate awareness. In general, respondents that interacted with campaigns focusing on locally relevant and narrative content showed higher result on the awareness measure than respondents that were exposed to the general information campaign. Figure 2 shows awareness scores by type of campaign, with a strong suggestion of narrative campaign type being superior to informational and visual-only campaigns. This visual illustrates the idea that narrative and localization examples enhances climate information engagement and retention, and this promotes the meaning of usages of tailored messaging in fostering perception and perception intention.



**FIG. 2: AWARENESS SCORE DISTRIBUTION ACROSS CAMPAIGN TYPES**

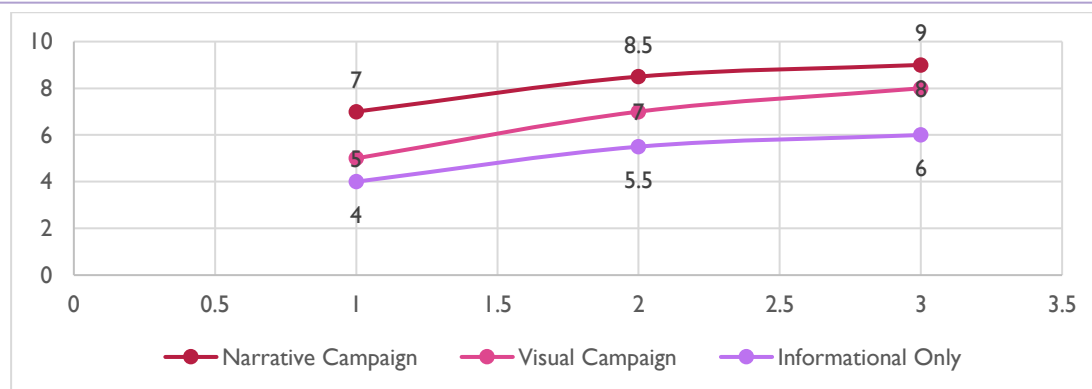
The mean scores of behavioral intention were compared by uses of Table 1 where the scores of the respondents who were exposed to the three main campaign strategies were highlighted. The highest ranking went to narrative campaigns and then visually-focused campaigns and lastly purely informational campaigns. The given comparison underlines the idea that the importance of the inclusion of relatable narratives and emotional appeal in presenting the needed topic drastically increase the chances of people implementing pro-environmental practices. The table also points out that the demographic variables of age and the level of education are moderately effective in affecting the campaign, which implies that the differences in groups and audience analysis need to be conducted when defining the climate communication strategy that would be productive.

**TABLE 1: BEHAVIORAL INTENTION COMPARISON ACROSS CAMPAIGN TYPES**

Campaign Type	Average Intention Score	Engagement Rate (%)	Awareness Level (0–100)
Narrative Campaign	4.2	78	85
Visual Campaign	3.6	65	70
Informational Only	3.1	50	60

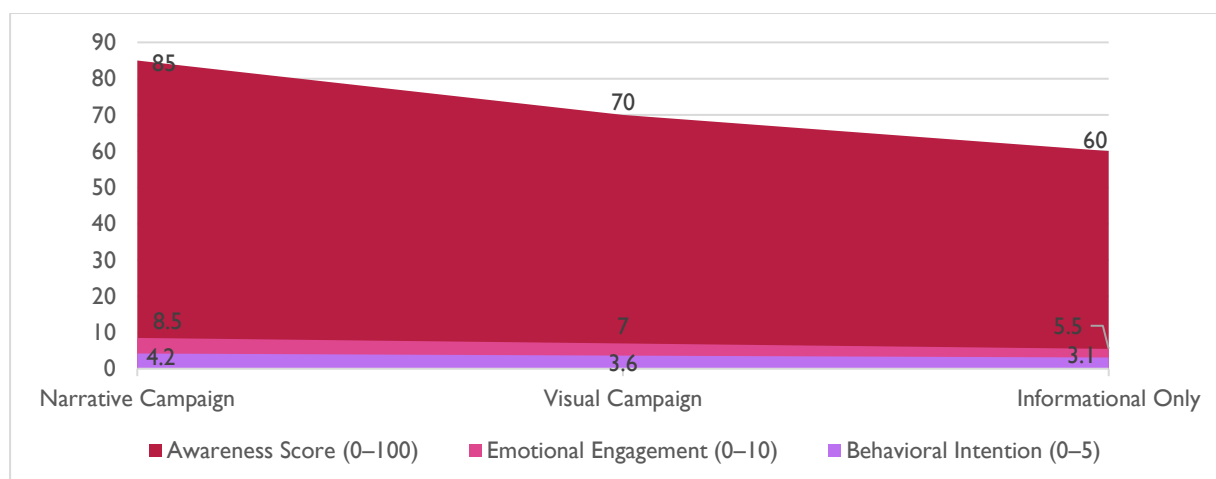
Sentiment scores (analysis) indicated campaigns that used positive affect strategies of hope, ownership, and involvement in the community were more effective than those that triggered fear or risk messages. Figure 3 exhibits the emotions engagement scores of participants and can be seen that campaigns containing both facts and emotions that are balanced received the winning scores. This is consistent with the idea that message retention and action are better supported when using emotion-based engagement specifically in combination with actionable suggestions.





**FIG. 3: EMOTIONAL ENGAGEMENT SCORES ACROSS CAMPAIGN STRATEGIES**

Additional analysis assessed the ties among awareness scores, perceived emotional engagement and reported behavioral intention. The findings showed that there exists a close positive relationship implying that campaigns that have established cognitive understanding and emotional appeal have the highest effect to encourage climate-beneficial actions. This connection is visualized in figure 4 where it can be seen that greater the engagement with emotions, the greater the awareness and likelihood to take action. Such observations show that integrating the communication of knowledge with emotionally-appealing persuasive content is the best way to make campaigns more effective.



**FIG. 4: RELATIONSHIP BETWEEN AWARENESS, EMOTIONAL ENGAGEMENT, AND BEHAVIORAL INTENTION**

Table 2 contrasts the successfulness of the campaigns used among the urban and semi-urban populations. Apart from the fact that narrative campaigns were effective across both contexts in all cases, there seems to be that the effect of particular communication strategies can be minimized or maximized by cultural, and regional influences. Respondents in the urban areas were somewhat more engaged and had higher intention scores, probably because of exposures to digital media and a higher baseline climate awareness. This comparison highlights the importance of adopting the campaigns to the local situations so that the campaigns can be most effective and can reach more people in an equitable manner.

**TABLE 2: CAMPAIGN EFFECTIVENESS ACROSS POPULATION SEGMENTS**

Campaign Type	Urban Engagement (%)	Semi-Urban Engagement (%)	Average Intention Score
Narrative Campaign	82	74	4.2
Visual Campaign	68	60	3.6
Informational Only	55	45	3.1

The general conclusions present the following decisive aspects. First, locally relevant campaigns and stories are more effective than pure information campaigns, which shows that when people have personal experiences relating to climate messages, it helps them perceive and latch on to them. Second, the emotional appeal is highly important in instigating the behavioral intention especially when it is used in connection with information of credibility and doable directions. Third,

it is a necessity to stratify the audience and regional differentiate in order to achieve the largest potential of the campaign because not every group of people is engaged equally in a campaign based on the demographics and regions [15].

Lastly, the modeled combination of all three variables (awareness, engagement, and behavioral intention) proves the idea that strategic environmental communication can be a valuable contribution to the achievement of SDG 13 goals. Campaigns informed by the elements of storytelling, emotional appeal, and locally oriented messages will have a) an informative impact on the population to promote the development of proactive behaviors and involvement in climate change on community levels. The results help offer useful recommendations to environmental institutions, policy makers, and communication planners interested in implementing evidence-based, outcome-oriented campaigns with the intent of achieving sustainable change.

## 5. CONCLUSION

As seen in this study, strategic environmental communication conducted persuasively and locally significant will increase awareness and participation among the citizens related to climate change, which will achieve SDG 13. Such persuasive campaigns based on storytelling, emotional appeal, and trustworthy sources demonstrate quantitative gains not only in acknowledgment of knowledge but also in the desire to take some action.

**Practical Limitations:** The research has limitations in geographic sense characterized by an urban and semi urban population that may not be fully representative of the rural population or the marginalized population. Behavioral measures acquired through self-reports can be potentially biased by social desirability, and due to the short-term nature of the study, it is unclear how the study will provide information about a lasting behavioral transformation. Also, the impact of the campaign can be mediated by similarly covered media or similar policy motions, the presence of which was not manipulated by the current study.

**Future Directions:** Future research directions can focus on long term behavioural results and incorporate various population samples especially in high risk climate areas. The integration of social network analysis and incorporation of digital analytics with the view to monitoring the levels of engagement in real-time, might give more insights concerning the diffusion of the messages and social influence. Moreover, the studies based on experimental designs to compare the specific persuasive strategies might improve the current state of knowledge about the most successful strategies to promote climate action on a global scale.

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