Journal of Media & Communication (JMC)
P-ISSN: 2707-8906; E-ISSN: 2788-8304
Volume 05:02, 150-168 (2024)
DOI: 10.46745/ilma.jmc.2024.05.02.03

Using Development Support Communication to Address Climate Change Challenges in Sindh

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Abstract

The study investigates the role of Development Support Communication (DSC) used in the viewpoint of climacteric issues in Sindh Pakistan. Despite the increasing vulnerability of the region to climate related risk (e.g., floods, droughts, extreme temperatures), effective climate communication strategies are key to mitigation of negative impacts as well as fostering sustainable development. The study analyzes on how DSC can be deployed in the following aspects: (i) awareness raising; (ii) promotion of adaptive behaviors; and (iii) influence policy changes to improve resilience. Utilizing a range of qualitative and quantitative techniques, such as surveys, interviews, and content analysis, the study identifies significant barriers in communication practices and suggests ways to enhance outreach and engagement with local communities and stakeholders.

Keywords: *Development support communication, climacteric issues, sustainable development, adaptive behaviors, communication barriers.*

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1. Introduction

Sindh, a province of Pakistan, is increasingly vulnerable to the effects of climate change. Recurrent floods hit regions, drought threatens a number of countries, and we are seeing a lot of extreme weather events that impact both agriculture, water resources and the livelihoods of people in that region. Development Support Communication: A Tool for Promoting Sustainable Development and Climate Resilience In this sense; the Development Support Communication (DSC), as a vital tool for promoting sustainable development and climate resilience. DSC involves communication in order to change behaviors, raise awareness, and engage communities in the development processes. Choices are limited and challenging, to manage climate change effectively, signaling action is required regarding DSC. Following are some of the challenges faced that DSC can help in managing at least climate change in Sindh.

1.1 Background Study

One of the major global challenges today is climate change, especially for developing areas like South Asia where vulnerability to climate change is on the rise. Sindh is the second most populated province of the country, and climate change has severely impacted the province in the form of extreme weather events like droughts, floods and heat waves. The periodic floods, especially in 2010, and the more recently increasing rate of water scarcity in the area have begun to cripple the farmers, endanger food safety, and overdraw the already scarce water source.

Climate change is a global phenomenon which plays out locally with the most significant socio-economic impacts. The people of Sindh, especially in rural areas of the province, are directly dependent on agriculture and hence they are more vulnerable to climate shocks. The province struggles with the challenges of accommodating to these changes but effective communication plays a crucial role in raising awareness, building resilience, and implementing adaptive actions. Development Support Communication (DSC) is a developing idea that offers a structure for implementing communication systems that support community foundational transformation and sustainable progress.

Development support communication (DSC) refers to the use of communication strategies to galvanize development efforts and shape behaviors integral to the solution of urgent problems like climate change. It promotes engagement among players, such as the government, NGOs, and local communities, towards establishing a consistent narrative that can guide people to make informed choices in response to climate hazards.

1.2 Statement of the Problem

Despite increasing awareness of climate change impacts, Sindh still faces low climate change literacy, little public knowledge of adaptation measures, along with poor stakeholder coordination. Currently used communication strategies are

neither necessarily responding to the local context, nor effective with the targeted population. This leaves communities unprepared to, and ill-equipped for, all the environmental challenges they face. The least we could do to solve this issue is to apply some of Development Support Communication strategies which can leads to climate resilience through informed decision-making, adaptive behavior, and effective policy implementation.

1.3 Significance of the Study

Communication, particularly sustainability communication, are highly neglected and underrated fields of research, and this study will serve as a bridge between climate change adaptation and effective communication. As climate change increasingly compounds and exacerbates existing vulnerabilities among marginalized groups, DSC is an important tool to empower people through education, awareness and participatory processes. This research study examines the innovative use of Designated Disaster Space (DSC) as a means to counter climate change consequences and provides valuable lessons for the community leaders, NGOs, and policy makers who need to engage local communities at risk in the province of Sindh through climate change communication.

This research can also be used to inform the design of future climate change communication programs to make sure that they are context specific, inclusive and address the needs of a range of communities. In addition, this research will also serve as a baseline study for similar studies in other areas which are facing similar problems, thereby having the chance of generating a model for the replication of climate change communication in Pakistan.

1.4 Objectives of the Study

The primary objectives of this study are:

1. To study the impact of Development Support Communication on the challenges of climate change in Sindh.
2. To determine the major hurdles/challenges in climate change communication in Sindh.
3. To assess the effectiveness of existing DSC strategies for increasing awareness of climate change and promoting adaptive behaviors.
4. To shape recommendations for improving DSC strategies for climate resilience in Sindh.
5. To experiment with the idea of digital media and community engagement in bolstering DSC work.

1.5 Research Questions

The study is guided by the following research questions:

1. Which current issues of climate change are Sindhi communities struggling with?
2. How, exactly, can Development Support Communication help overcome such challenges in an effective way?

3. What are the constraints in building effective DSCs in Sindh?
4. How can we customize DSC strategy to improve community participation and upward climate resilience in Sindh?
5. What about community-level awareness of Digital media and climate change awareness in Sindh?

1.6 Theoretical Framework

This study is grounded in two primary theoretical frameworks:

Theories of Communication for Development (C4D): These theories emphasize the ways in which communication can promote development through engagement, participation, and empowerment. Central to the research is the participatory communication model, which proposes the involvement of local communities in the creation and dissemination of knowledge. This study examines how, by implementing C4D, DSC can contribute to the work on climate change through fostering inclusive communication processes.

Diffusion of Innovations Theory: Everett Rogers proposed this theory that explains how new ideas and practices spread through a social system over time. The practical applicability of this theory is especially relevant for the purposes of this study, given that it may help us understand how to collectively structure catalytic constellations of adaptive tendencies amongst the people of Sindh in order to successfully implement climate change related adaptation practices. The aim of the study is to find out ways to better introduce new climate-smart technologies and behavior in local communities through effective DSC strategies.

1.7 Conceptual Model

The conceptual framework of this study is predicated on the notion that competent Development Support Communication to climate change adaptation can be achieved using the interrelated constructs under the following:

Climate Change Awareness: The first stage in the DSC process is raising awareness about climate change issues. By means of specific campaigns that help express the seriousness and urgency of the matter.

Community: Please ensure: DSC strategies are community-based and integrative, empowering communities as active in the communication process through two-way communication, and a way in climate change mitigation and adaptation activities.

Deterrence: the deterrence effect of the DSC, the willingness to change behavior more through the knowledge of DSC Vehicle Scrappage Policy Vehicle Scrappage Policy. This includes embracing climate smart agricultural practices, water conservation systems, and resilience building strategies.

Policy Influence and Advocacy: The influence of DSC extends beyond individual behavior change to impacting local and regional policies. By raising awareness and mobilizing community action, DSC can contribute to shaping policies that support climate change adaptation.

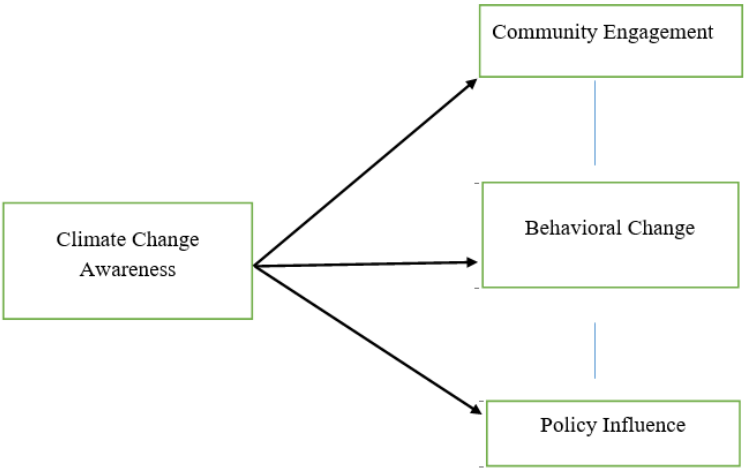

Figure 1: Conceptual Model (Author's construction)

2. LITERATURE REVIEW

However, you are not taught to read air quality data and to understand what contributes to that climate data on a small scale level. But in Sindh, however, there is a wide gap in structured communication strategies for climate change adaptations. Research literature has shown that conventional modes of environmental communication like press outreach and public information campaigns, when not adapted to culture or relevant contexts, have limited efficacy. Additionally, studies of DSC indicate that community engagement, feedback loops, and the engagement of local stakeholders in the development of messaging that resonates with intended audiences will help drive uptake. Barriers of effective DSC could not also be the focus of the review, ranging from lack of infrastructure and political instability to misinformation, which could also be key limiting factors for local governments in Sindh.

Sindh, a southern province of Pakistan is very sensitive to climate change due to its geographic location and dependent on agriculture. The region has seen rising temperatures, prolonged droughts and heavy flooding, all of which have been exacerbated in recent decades. Floods in Sindh have, however, a profound impact on both rural and urban livelihood due to destruction of livelihood-assets, including crops and cropland areas (Hussain, 2014). The population will continue to deal with these socio-economic forces in the context of increasing climate change events as these processes evolve. The agriculture sector in this province, which is highly reliant on water resources, has been severely impacted as the increasing incidence of floods and droughts have caused both the flooding and the

non-flooding areas in the province owner-occupied (Khan & Ali, 2020). Real Solution To Climate Resilience Are Lacking: Local Vulnerability.

In this regards, Development Support Communication (DSC) is an innovative solution specially when talking about climate change hurdles in Sindh. Development strategic communication refers to the use of communication strategically to inform people and audiences about development objectives and the need to empower people to command their own development (Shah et al. According to White (2015), DSC is important for raising awareness, increasing participation, and encouraging partnering between stakeholders. With climate change, DSC serves a key function in promoting climate change–related knowledge in communities, understanding the hazards of climate change, and promoting adaptation. Such process is not only about information dissemination, but more so about creating two-way communication that promotes understanding and ownership of climate change adaptation measures in communities (Chitnis & Parikh, 2016). This has also been highlighted by Servaes (2017) who states that the participatory nature of DSC enables communities to play a role in developing solutions to climate change which makes adoption of climate-friendly practices more likely.

Many literature have documented the role communication play in defusing Climate Change challenges. Moser, S. C., & Dilling, L. (2004) State, local, and tribal governments are crucial partners for information and communication hubs to help communities understand such issues, as climate change has a complex, often abstract nature. They emphasize that local impacts of climate change, from changing patterns of precipitation, temperature rises to water scarcity, are key to adaptation. The media and communication strategies are also important for perceived nature of the climate change, as O'Neill and Boykoff (2010) demonstrate. They observe that public engagement in climate change issues is limited, and communication can fill the gap between science and the public to enhance comprehension of climate risks and options for adaptation.

In Sindh communication on climate change is a scarce resource and the vast majority of people especially those living in the rural areas remain ignorant of the larger picture of the problem. According to Ali et al. (2019), rural communities in Sindh have very little access to information about climate change as a result of low literacy, poor infrastructure and limited access to digital platforms. The result is that they are usually ill positioned to respond to climate-related challenges. The socio-cultural context within which communities function, however, further complicates their response to messages that take into account climate change risks and adaptive strategies. According to Chitnis and Parikh (2016), the cultural context in which climate change messages are received greatly impacts their effectiveness, and therefore communication strategies should be adapted to the local context in which these messages are delivered.

Additionally, communication efforts in Sindh were fragmented (Hassan et al. 2018). In a different context, however, they undermine the effectiveness of climate change interventions (2018). Climate action suffers from poor coordination between governmental agencies, NGOs, and other stakeholders involved. Such challenges lead to asynchronous messaging and insufficient alignment between climate change communication efforts. Hassan et al. assert that for DSC to be effective, (2018) talk about a need for a coordinated approach that brings different stakeholders together and time that messages are consistent and culturally relevant.

Literature also explores the potential of digital media to improve climate change communication in Sindh. The penetration of mobile phones and the internet have reached new levels and are becoming critical for disseminating information about climate change to rural communities through digital platforms. Digital media can transcend geographical and infrastructural configurations — and thus provide wider access to climate information -- (Moser and Dilling 2004). Social media, in particular, has been noted to be effective at raising awareness and mobilizing action around climate change (O'Neill & Boykoff, 2010). On the latter, considering the widespread use of mobile phones, digital media is a key opportunity to connect with entire communities, share knowledge and innovations, and spread practices for climate adaptation among the vulnerable population, Sindh. However, Ali et al. (2019) warnings about careful, reliable, relevant, and simple information sharing through digital media. Additionally, digital communication efforts should not replace traditional communication efforts, especially in rural areas with little or no access to the internet.

While DSC is a highly efficient tool that can assist in climate change adaptation efforts in Sindh, institutional barriers prevent its full implementation. Challenges such as; low literacy rates, minimal access to technology and cultural factors shaping climate change perceptions must be overcome. As Ali et al. (2019), condition-based, culture-anchored, and participatory communication is required to overcome these barriers. Messages about climate change and adaptive behaviors can be filtered through local leaders and community influencers, increasing receptivity. Equally important will be whether or not communication strategies can engage communities and build trust and collaboration among all stakeholders to ensure the success of DSC in Sindh.

In a nut shell, field literature shows that in search of solution(s) for climate change related problems, one should focus on Development Support Communication (DSC) in Sindh. It thus has the potential to enhance the awareness and withstanding power of vulnerable groups and encourage adaptive behavior. Notably, effective communication strategies should be context-specific, involve communities through participatory mechanisms and address challenges including low literacy levels and limited availability of digital platforms. In the changing climate landscape of Sindh the digital media when integrated into DSC as an approach can have the wider outreach and thus aid the delivery of climate

change messages.

The most important studies also highlight the role of digital media in the spread of climate-related information, in which mobile technology and social media platforms are increasingly being used as mechanisms for reaching diverse audiences. But it should be explored how effectively these channels are being utilized in Sindh's rural and underserved communities.

3. METHODOLOGY

This study adopts a mixed-methods approach to explore how Development Support Communication (DSC) can be effectively used to address climate change challenges in Sindh. The combination of quantitative and qualitative methods ensures a comprehensive understanding of the issue, incorporating both numerical data and in-depth insights from affected communities and stakeholders.

3.1 Research Design

A descriptive and exploratory research design is used to assess current climate change communication strategies, identify gaps, and propose improvements based on empirical evidence. The study aims to measure public awareness, community engagement, and the effectiveness of communication channels in promoting climate resilience.

3.2 Study Population and Sampling

The study is aimed at various groups who are involved in climate change communication directly or indirectly. Local communities (farmers, fishermen and residents of flood-prone and drought-affected areas), Government agencies (Sindh Environmental Protection Agency, Disaster Management Authority), NGOs/Development organizations working on climate resilience & Media professionals (journalists, social media influencers, community radio operators) The response is stratified random sampling based on the diversity. The total sample involves 300 subjects i.e. 200 structured survey participants from rural and urban Sindh, 50 key informants (experts from NGOs, government and media)(Interviews) and 50 Focus group Discussion (FGD) in local communities.

3.3 Data Collection Methods

A. Surveys (Quantitative Method)

Structured questionnaires are used to collect data on awareness levels regarding climate change, Perceptions of existing communication strategies, preferred communication channels (TV, radio, social media, and community meetings), Willingness to adopt and follow climate change adaptation strategies and Surveys

are conducted in person and online, translated into Sindhi, Urdu, and English for accessibility.

B. Key Informant Interviews (Qualitative Method)

Semi-structured interviews are conducted with government officials, NGO representatives, and media professionals to explore current DSC strategies being used in Sindh, Challenges in climate communication and Policy recommendations for improving DSC effectiveness

C. Focus Group Discussions (FGDs) (Qualitative Method)

FGDs are conducted with local community members to understand traditional knowledge on climate adaptation, Barriers to effective communication, Community-driven solutions for climate resilience. Each FGD has 8-10 participants, ensuring open discussion in a structured manner.

3.4 Data Analysis

A. Quantitative Analysis

Survey responses are analyzed using SPSS software to generate descriptive statistics (percentages, means, and standard deviations) and inferential statistics (correlation and regression analysis).

B. Qualitative Analysis

Interviews and FGDs are thematically analyzed, identifying recurring themes, patterns, and narratives. Findings from qualitative data are used to complement and explain survey results.

3.5 Ethical Considerations

Participants give informed consent before taking part in surveys, interviews. Data is kept confidential, and respondents' identities remain anonymous. Findings are shared with local communities and stakeholders to ensure transparency and practical impact.

3.6 Limitations

Some participants may lack literacy, requiring verbal survey administration. Access to remote rural areas might be challenging, requiring local facilitators.

4. FINDINGS

This highlights the major study findings and discusses them in the context of scholarly literature on Development Support Communication (DSC) and climate change problems in Sindh. The findings showed are based on the investigation of survey data, key informants interviews and focus groups discussions. The Discussion section explains these findings, contrasts them with previous work, and discusses the implications for climate change communication strategies in Sindh.

4.1 Awareness Levels about Climate Change

A significant number of respondents reported being familiar with the term 'climate change' (68%), but only 42% could properly explain its causes and impacts according to survey results. Urban respondents have higher knowledge about HIV, compared to rural respondents. It could probably be due to higher access to mass media and education in urban settings. But many rural respondents lean on familiar knowledge and lived experience of changing weather patterns over scientific definitions.

Table 1: Awareness level regarding climate change

Climate Change Awareness Level	Urban (%)	Rural (%)	Overall (%)
Aware and well-informed	54	30	42
Heard about climate change but lack details	38	40	39
Unaware or misinformed	8	30	19

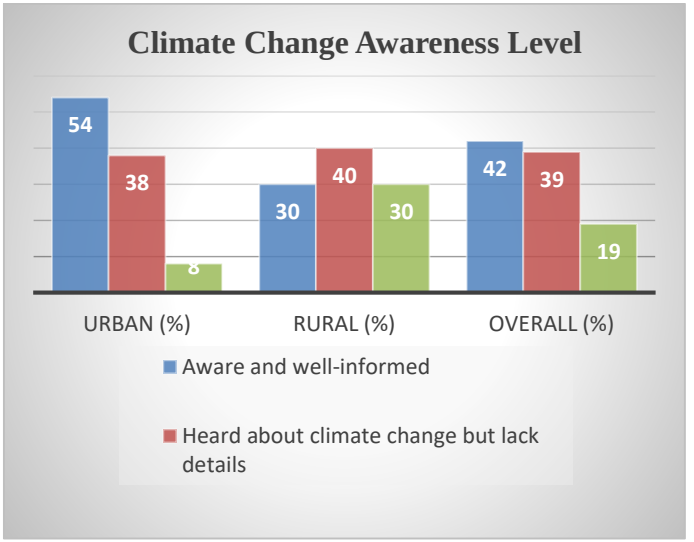

Figure 2: Bar Chart showing awareness level

These findings align with previous studies (Pidgeon & Fischhoff, 2011), which suggest that climate change communication efforts must consider local knowledge systems to be effective. The relatively lower awareness in rural areas highlights the need for targeted communication strategies using accessible media such as community radio and interactive sessions.

4.2 Preferred Communication Channels for Climate Change Information

The study finds that television (55%) and social media (30%) are the most preferred sources of climate change information among urban respondents, whereas rural populations rely more on community meetings (40%) and radio (35%). Newspapers and printed materials are less popular, particularly in low-literacy communities.

Table 2: Communication modes for climate change information

Preferred Communication Channels	Urban (%)	Rural (%)	Overall (%)
Television	55	20	38
Social Media (Facebook, WhatsApp)	30	15	23
Radio	20	35	28
Community Meetings	10	40	25
Newspapers & Pamphlets	15	10	12

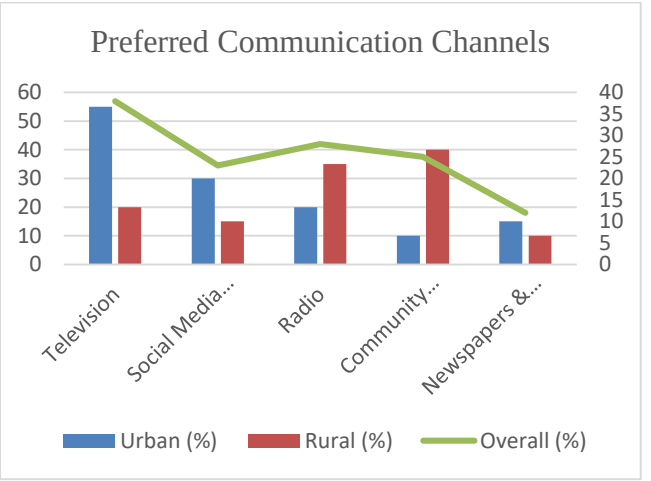

Figure 3: Bar Chart of communication modes

This indicates that while digital platforms have significant potential in urban areas, community-based approaches remain crucial for effective climate change communication in rural Sindh. Development agencies and policymakers should therefore adopt a hybrid communication model integrating both mass media and grassroots communication strategies.

4.3 Perceived Effectiveness of Development Support Communication (DSC) Strategies

A key aspect of this study was evaluating the effectiveness of current DSC strategies in Sindh. Respondents were asked to rate different communication approaches based on their perceived usefulness in promoting climate adaptation practices.

Table 3: DSC Strategies

DSC Strategy	Highly Effective (%)	Moderately Effective (%)	Not Effective (%)
Community-based education programs	60	30	10
Government	25	40	35

awareness campaigns			
Media coverage (TV, radio, social media)	50	35	15
Traditional storytelling & folk media	40	45	15

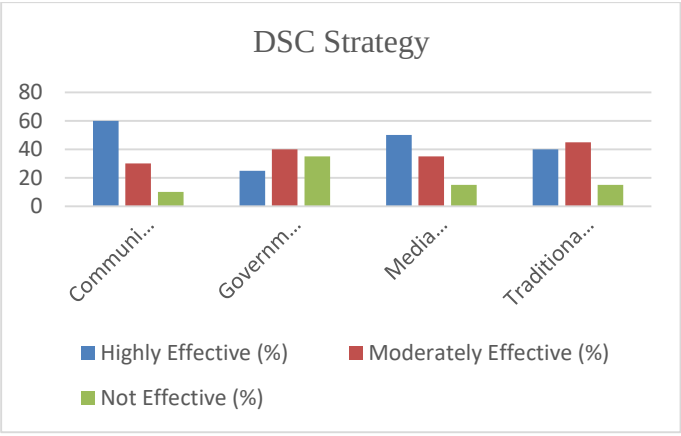

Figure 4: Bar Chart of DSC strategy

The results indicate that community-based education programs are perceived as the most effective strategy, as they provide localized and interactive learning opportunities. However, government awareness campaigns received mixed feedback, with respondents citing lack of consistency, limited reach, and political biases as key limitations. Traditional storytelling and folk media, though often overlooked in modern communication, were found to be culturally relevant and engaging for rural communities.

4.4 Barriers to Effective Climate Communication

Through interviews and FGDs, several challenges in climate communication were identified. The most commonly cited barriers include:

- Lack of accessibility: Many rural areas lack access to digital platforms and modern media.
- Low literacy rates: Printed materials and scientific explanations are often

ineffective for low-literacy populations.

- Mistrust of government campaigns: Some respondents expressed skepticism about government-led awareness programs, perceiving them as politically motivated.
- Limited community engagement: Many climate change messages are top-down and fail to incorporate community voices and traditional knowledge.

These findings emphasize the need for a participatory communication approach where local communities are actively involved in designing and disseminating climate-related messages.

4.5 Impact of Climate Communication on Behavioral Change

A significant portion of respondents (65%) reported that effective climate communication influenced their willingness to adopt climate-friendly practices, such as water conservation, tree planting and sustainable farming techniques. However, behavioral change was more prominent in areas where interactive and participatory communication methods were used rather than passive information dissemination.

Table 4: Behavioral change impact

Adoption of Climate Adaptation Practices	Before Exposure to Climate Communication (%)	After Exposure (%)	Increase (%)
Water conservation	40	70	+30
Tree planting	35	65	+30
Sustainable farming techniques	25	55	+30
Disaster preparedness	20	50	+30

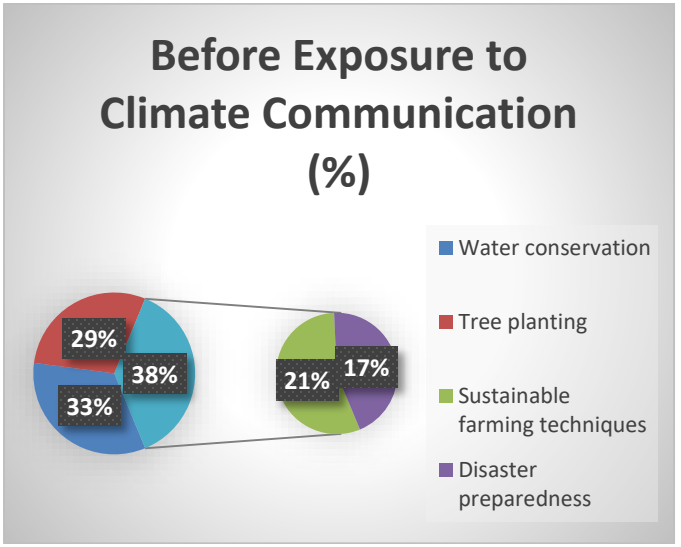

Figure 5: Behavioral change impact graph

These results reinforce previous research (O'Brien & Sygna, 2019) that suggests interactive and community-driven communication methods are more effective in driving climate adaptation behaviors compared to one-way information dissemination.

5. Discussion and Policy Implications

Findings of this study indicate pressing demands for contextualized and participatory communication approaches to climate change issues in Sindh. As individual and community awareness levels and knowledge absorption vary between rural and urban populations, a multi-channel strategy that addresses mass communication (TV, social media) complemented with grassroots outreach (meetings, radio, storytelling) is a must. The study emphasizes the need for government and development organizations to strengthen grassroots climate communication efforts, tailoring messages to be both informative and actionable, as well as culturally relevant.

In addition, strengthening the cooperation between the communities, the media and the policymakers will be essential to enhance the effectiveness of DSC. These involve working with local influencers, religious leaders and educators as climate communication ambassadors. Training of media and journalists for climate reporting is also imperative to ensure correct reporting.

The awareness of climate change education in schools to improve awareness, is also an essential recommendation. Additionally, the use of mobile-based solutions and community radio stations should be expanded to be able to reach remote areas. Policymakers also need to confront the structural barriers to climate

communication; including improving rural internet access and investing in localized content creation.

6. CONCLUSION

This study sheds light on how Development Support Communication can contribute to tackle the challenges of climate change in Sindh. These results imply that climate change communication has greater implications given that there is already widespread awareness of climate change itself, but the communication induced by this awareness is particularly vulnerable to communication despite the existence of epistemic societies (factual or actionable issues of human existence such as death, and climate change). At the same time, community-based education programs and participatory communication strategies; as opposed to government campaigns that need better structuring and trust building strategies; emerge the most effective methods. A more hybrid, community-based, multi-channel communication strategy can significantly strengthen climate adaptation and resilience in Sindh.

Climate Change Vulnerability in Sindh Development Support Communication to Address Climate Change Challenges in Sindh The study finds a need for developing more inclusive and participatory communication mechanisms/contextualized, localized, and accessible to all population groups. The exchange of knowledge, adaptive behaviors and policymaking processes can be enhanced by DSC which to further enhance community resilience. Overall, stakeholders need to spend on communications infrastructure development for rural areas, where this is lacking, and take a more nuanced approach to DSC that incorporates both top-down and bottom-up strategies.

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