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RESEARCH PAPER

Public Perceptions of Climate Change and their Influence on Adaptive and Mitigative Behaviors in Sargodha City

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ABSTRACT

This study assess how public perception influences climate change adaptation and mitigation behaviors in Sargodha City, Pakistan. Rapid urbanization and limited institutional capacity pose challenges for climate responsiveness. The study employs the Theory of Planned Behavior (TPB) to examine how awareness, knowledge, and concern shape environmentally responsible behavior. A cross-sectional survey of 300 residents was conducted, focusing on their awareness, knowledge, and emotional concern regarding climate change and its impact on behavior. Findings indicate that awareness alone shows a weak link to behavioral change, while climate change concern (worry) strongly predicts adaptive and mitigative behavior. Knowledge also plays a role but explains only a small variance in behavior. Emotional motivation emerges as a more effective behavioral driver than factual awareness. The study urges a shift from awareness-only campaigns to emotionally engaging, context-specific interventions. It recommends grassroots climate strategies that combine motivational triggers with institutional support to foster sustainable urban resilience.

KEYWORDS Climate Change, Awareness, Global Warming, Environmental Concern, and Adaptation

Introduction

Climate change is one of the greatest global challenges of the twenty-first century that affects the entire population, crops, environmental stability, and economic development significantly (IPCC, 2023; Nadeem, et. al., 2023). Climate change is an issue many believed was a far-fetched and impalpable menace that was far-fetched but is increasingly manifesting itself more visibly in localized areas, in places such as Pakistan, which are lowly developed. Rapid growth in cities, inadequate resource management, and low resilience to changes in climate especially predispose cities such as Sargodha. In Sargodha, climatic changes that have begun to take place in the last few years include significant warmth temperatures, rainfall patterns that are irregular and extreme length heat waves. The rising local climate variability manifests in one of the frightening trends as the temperature recorded in the city reached up to 47^0C in April 2024, which was too high in comparison to the past data of temperatures in April, which was 35^0C to 39^0C on average over time (Pakistan Meteorological Department, 2024). Similarly, there are rare but extreme weather conditions that have become frequent here, including heavy dust storms and off season thunder storms, which are becoming more prevalent in this region (Rasul, et. al., 2022). These dynamic climatic patterns raise severe challenges to the social-economic make-up of the city (Abubakar et al., 2024). Increasing heat stress and shifting rainfall patterns pose a special threat to

agriculture, which is a major source of income in Sargodha and the surrounding areas. Similarly, poor air quality, waterborne infections, and heat-related illnesses pose increased risks to public health systems. Climate-related stresses like flooding, power outages, and water scarcity add to the strain already placed on infrastructure by fast population growth and low investment. Even though these issues are urgent, most climate change responses are still centralized and policy-driven, frequently ignoring the significance of grassroots efforts. Effective climate change mitigation necessitates significant engagement at the individual and community levels, even though global accords such as the Paris Accord and national climate plans provide a framework for concerted efforts (UNFCCC). Strategies for local adaptation and mitigation are essential for lowering long-term vulnerability as well as increasing community resilience. Changes in everyday infrastructure and behavior, such as switching to climate-resilient crops, enhancing water management, and implementing early warning systems for extreme weather events, are examples of adaptation efforts (Safi et al., 2012).

Conversely, mitigation aims to address the underlying causes of climate change, such as by lowering carbon emissions, supporting renewable energy, taking public transportation, and taking part in waste reduction and tree-planting campaigns (Moser & Ekstrom, 2010). The roles of public perception, more especially how people view, comprehend, and prioritize climate change, is central to these responses. The most crucial cognitive and emotional influencers that can make people act with regard to climate issues are the awareness of the population, knowledge, and concern (Abubakar, Naz, Rehman, & Fatima, 2023). It has been found that wise people tend to engage in adaptive and meditative practices when more informed and worried about climate change (Whitmarsh, 2009; Leiserowitz et al., 2020).

How far, in fact, this correlation is valid in new urban environments such as that in Sargodha, is not yet clearly comprehended. Since Sargodha is a middle-sized urban center in Punjab that is considered a transition of rural and urban socioeconomic patterns, the case is unique, because it will help to examine the situation with public perception of the climate. The urbanity is overwhelming with institutional weaknesses and the issue of public participation on climatic factors as well as environmental stresses that come along with its expansion. There is not much known about whether or not this finds translation in real action at the household or community levels but there are anecdotal evidence to the fact that there is growing awareness of aberrant weather conditions. The project will find out the level of public awareness, knowledge and concern of Sargodha City on climate change and the impacts of these factors on individual and group behaviour on climate change mitigation and adaptation. The research will enlighten the aspects of social and psychological process of climate response in a semi urban environment of Pakistan through conducting a situational analysis of the local realities. It will also furnish local educators, legislators, and environmental groups with useful information to develop narrowly targeted interventions that promote climate-resilient attitudes and behavior.

Literature Review

Climate change has transformed into a socio-political issue rather than a scientific concern and needs to be addressed on all levels in the society. The national climatic actions and international agreements such as the Paris Climate Agreement (UNFCCC, 2021) have provided general guidelines, but the efficiency of actions on climate can be significantly influenced by the community and individual participation. Leiserowitz et al. (2020) state that scholars emphasize that mitigation and adaptation

are not only technological or infrastructure-related activities but also have a social mobilization, behavioral change, and public perception aspect. Thus, the approach to enhancing climate resilience, especially in developing nations, needs the knowledge about the perceptions of climate risks and the perception of their impact on the behavior of the population. Since mitigation involves reducing the extent or the speed of climate change, primarily by cutting back on the emission of greenhouse gases, adaptation involves the changes in practices, processes, and structures to minimize the adverse features of climate change (IPCC, 2023). Individuals also adapt locally through changing farming practices, use of air conditioning in summer periods or preparation against extreme weather conditions (Safi et al., 2012). Acts such as energy conservation, use of renewable energy, recycling and promotion of transport systems that are friendly to the environment are some of the examples of mitigating behaviours (Moser & Ekstrom, 2010). Knowledge, worry, perceived vulnerability, and social norms are among the most common cognitive and affective factors that serve as mediators in the decision to take part in such activities (van der Linden, 2015).

Among the main theories that form the basis of such relationship, there is Theory of Planned Behavior (Ajzen, 1991) according to which the intention and, subsequently, the behavior are affected by attitudes, subjective norms, and perceived behavioral control. Applying the theory to climate change, it means that people tend to change in case they are informed about the issues, they care about them and they are sure that they can make a difference. This statement is confirmed by loads of researches. Indeed, Whitmarsh (2009) found out that the more people are aware and feel more efficacious, the more they tend to take adaptive and meditative courses of action. The view of climate change however differs depending on the population or region. It is affected by social economic status, education, exposure to content in media, ones experiences, and institutional trust (Lee et al., 2015). The awareness of climate change is also very low in Pakistan particularly in the rural and semi-urban regions (Mirza, 2011). Although citizens are directly affected by climate change most of them lack access to credible information or do not think that climate change is a risk to suffer immediately. This gap has been identified even in areas such as Sargodha where subjective reports support that a sense of unease is on the increase but we have only weak or occasional objective behavioral evidence of changes in behavior.

Research carried out in other similar settings within South Asian regions also demonstrates that the perceptions and responses of people in relation to the changes on the environment are often subject to the norms held by society, religious beliefs, and economic priorities (Mustafa et al., 2015). Climate change may not be an issue of great concern in a place where individuals are only concerned with how to make ends meet. This underlines the importance of regional studies examining the manifestation of climate awareness and concern in the view of distinct sociocultural settings. Gender, education and availability of information play important roles as well. According to research by Ayesha et al. (2020), women and more educated people are more familiar with the issues of the climate and meditative policies. Similarly, one cannot overrate the role of the media in forming the opinion and perception of the danger. According to Schafer and Painter (2011), the various ways in which the people view and place priority on climate change, like whether climate change is reported as a moral, political or scientific concern, affects how people perceive and give priorities to climate change.

Hypotheses

H1: There is a significant positive relationship between public awareness of climate change and adaptation and mitigation behaviors in Sargodha City

H2: There is a significant positive relationship between public knowledge of climate change and adaptation and mitigation behaviors in Sargodha City.

H3: There is a significant positive relationship between public concern about climate change and adaptation and mitigation behaviors in Sargodha City.

Theoretical Insight

The theoretical foundation of this research is the Theory of Planned Behavior (TPB), developed by Icek Ajzen in 1991 and an effective model of how the psychological factors shaped the human behavior. The TPB proposes that one is influenced by the constructs of attitude toward the behavior, subjective norms, and perceived behavioral control as they affect the behavioral intention of a person. The extent concerning the attitude as favorable or unfavorable to the behavior under consideration is known as attitude. Perceived behavioral control entails the ease or the difficulty of behavior perceived to be and may also have a direct effect on behavior. Subjective norms entail imagined social pressure to do or not do the behavior. The combination of these constructs is particularly useful when, studying the implications of cognitive (knowledge), affective (concern), and contextual (control and norms) factors affecting the responses of people to climate change.

TPB offers an effective model to explain why individuals take adaptive and mitigating responses in climatic change phenomenon in contrast with those who do not under similar circumstances of environmental stress called scrutiny. It can be considered that individuals who are more knowledgeable on the effects and causes of climate change e.g. are more likely to hold to attitudes that promote climate-resilient behavior. Likewise, a more emotional response as concern about climate change can significantly stimulate the desire of an individual to act. As per the TPB model, the knowledge/awareness is the criterion which can affect the attitude, and concern is an emotional driver that might reinforce the conscious element of behaviour. It implies that emotionally motivated and well-informed individuals concerning the climate science are likely to engage in both adaptive (such as altering their daily activities and preparing to respond to the extreme weather incident) and mitigative (such as reducing energy consumption, recycling, and using public transport) measures.

The TPB framework also recognizes that intentions and attitudes by themselves are insufficient to ensure behavior change. A key factor is perceived behavioral control, which encompasses an individual's confidence in their abilities and resources. Even knowledgeable and concerned people may feel helpless or limited in their ability to take action in places like Sargodha, where public service delivery, policy implementation, and infrastructure are frequently lacking. Despite positive attitudes, this perceived lack of control may compromise behavioral intentions. Therefore, as moderating or controlling factors that can either facilitate or impede the translation of intention into action, the study takes into account socio-demographic and contextual factors like income, education, occupation, and information access. For instance, even if both have the same level of knowledge and concern, a person from a higher-income

household with access to renewable technologies might find it simpler to adopt mitigating behaviors than someone from a lower-income background.

Additionally, in collectivist societies like Pakistan, where social norms and community practices have a significant impact on individual behaviors, the subjective norms component of TPB is especially pertinent. People may be more inclined to follow socially acceptable climate-adaptive practices if they are promoted, for example, by recycling initiatives at the local level, group tree-planting events, or religious and educational teachings encouraging environmental stewardship. On the other hand, even motivated people may encounter conflict or social disapproval if the social environment is unconcerned or doubtful about climate change, which would limit their willingness to participate. Subjective norms are implicitly taken into account when discussing the social and cultural elements that influence perception and behavior in semi-urban areas like Sargodha, even though they were not measured explicitly in this study.

Also, the TPB allows interactive performance among the constructs as well as feedback mechanisms. The simplest climate-positive behavior e.g. reducing the usage of plastic, can help raise the level of self-efficacy which further on would enhance the level of the behavioral control and eventually contribute to the occurrence of more complicated behaviors. Similarly, the observation of practical climate impacts, such as heat wave or flooding, may increase an individual anxiety level, reinforce personal beliefs, and restore accepted norms in the community. These relationships point to the complexity of behavior change and to the importance of complex interventions able to operate on several levels simultaneously: structural, emotional, and informational.

Material and Methods

The research uses a positivist paradigm which is principled by empirical testing and objective measurement. Data were collected on a specific time using a cross-sectional survey design so that patterns and relationships between relevant variables were identified. A convenience sampling method was employed in selecting 300 respondents of diverse demographic representations, i.e., differences in age, gender, education, income, and occupation levels, in which to represent the full scope of the urban population. The structured questionnaire was used to collect the data online and by face to face interaction to popularize the collection of data. The data was analyzed using version 26 of the Statistical Package for the Social Sciences (SPSS). Correlation analysis was used to ascertain the direction and strength of the relationships between the independent and dependent variables. Furthermore, regression analysis was employed to determine the extent to which public awareness, knowledge, and concern predicted adaptive and mitigating behaviors. All ethical guidelines were strictly followed during the study. Each participant provided their informed consent, and anonymity, confidentiality, and voluntary participation were ensured to uphold the ethical integrity of the research process. Detailed Table of Demographics of all respondents is given below:

Table 1
Frequency and Percentage Distribution of Demographic Variables

Categories	Frequency	Percent
Age in Years		
18 to 24	218	72.7%
25 to 34	59	19.7%

35 to 44	6	2.0%
45 to 54	13	4.3%
55 to 64	4	1.3%
Gender		
Male	135	45.0%
Female	165	55.0%
Level of Education		
Primary	6	2.0%
Matriculation	6	2.0%
Intermediate	91	30.3%
BA	35	11.7%
Bachelors or MSc	139	46.3%
M-Phil	23	7.7%
Monthly Household Income		
20k to 39999PKR	91	30.3%
40K To 59999PKR	71	23.7%
60K To 79999PKR	24	8.0%
80K To 9999PKR	33	11.0%
1 Lakh or Above	81	27.0%
20k to 39999PKR	91	30.3%
Occupation Status		
Student	192	64.0%
Farmer	11	3.7%
Private job	46	15.3%
Government Job	15	5.0%
Self employed	18	6.0%
Unemployed	18	6.0%
Ethnicity		
Punjabi	267	89.0%
Saraiki	16	5.3%
Pashtun	3	1.0%
Baloch	6	2.0%
Prefer not to say	8	2.7%
Total	**300**	**100.0**

Table 1 show that most respondents (72.7%) are between the ages of 18 and 24, indicating a largely youthful sample, with 19.7% being between the ages of 25 and 34. Just 7.6% of the sample is composed of people 35 years of age or older. Gender-wise, women make up a small majority at 55%, while men make up 45%. With 46.3% of participants having a bachelor's or master's degree and 30.3% having intermediate-level education, the majority of participants have a strong educational background. A tiny percentage only have matriculation (2%) or primary (2%) credentials. A mixed-income distribution is seen in the household income distribution, with the largest segment (30.3%) earning between PKR 20,000 and 39,999 per month, followed by 27% earning PKR 100,000 or more. According to occupational status, the majority are students (64%), followed by those who work for the government (5%), privately (15.3%), or as independent contractors (6%); unemployment is 6%. Lastly, the majority of the population is Punjabi (89%), with smaller percentages of Saraiki (5.3%), Baloch (2%), Pashtun (1%), and 2.7% choosing not to reveal their ethnicity.

Results and Discussion

Table 2
Correlations

		Awareness of Climate Change	Adaptation and Mitigation Behaviors
Awareness of Climate Change	Pearson Correlation	1	.089
	Sig. (2-tailed)		.123
	N	300	300
Adaptation and Mitigation Behaviors	Pearson Correlation	.089	1
	Sig. (2-tailed)	.123	
	N	300	300

There is a very weak (r = 0.089) and non-statistically significant (p = 0.123) association between climate change knowledge and adaptation and mitigation practices. This implies that while there is a marginally positive correlation between climate change awareness and action, awareness by itself is not a reliable indicator of whether people would adopt eco-friendly practices. People's behavior may be influenced by variables other than awareness, which suggests that more encouragement and assistance are needed to promote successful climate change adaptation and mitigation.

Table 3
Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.249[a]	.062	.059	8.37665

a. Predictors: (Constant), Knowledge of Climate Change

ANOVA[a]

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	1383.320	1	1383.320	19.714	.000[b]
Residual	20910.160	298	70.168		
Total	22293.480	299			

a. Dependent Variable: Adaptation and Mitigation Behaviors
b. Predictors: (Constant), Knowledge of Climate Change

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	18.653	1.893		9.853	.000
Knowledge of Climate Change	.735	.166	.249	4.440	.000

a. Dependent Variable: Adaptation and Mitigation Behaviors

According to the regression analysis, adaptation and mitigation behaviors are significantly predicted by awareness of climate change (β = 0.249, p < 0.001). Although knowledge has a favorable impact on climate-friendly acts, it only explains a small portion of the factors that motivate such behaviors, as the model explains around 6.2% of the variation in these behaviors (R2 = 0.062). This implies that people are also motivated to pursue adaptation and mitigation strategies by factors otherthan knowledge.

Table 4
Correlations

		Adaptation and Mitigation Behaviors	Concern about Climate Change
Adaptation and Mitigation	Pearson Correlation	1	.484**

Behaviors			
	Sig. (2-tailed)		.000
	N	300	300
Concern about Climate Change	Pearson Correlation	.484**	1
	Sig. (2-tailed)	.000	
	N	300	300

The fear of climate change positively correlates with the adaptation and mitigation measures in a moderately significant manner ($r = 0.484$, $p < 0.001$). This implies that the individuals who are more anxious about climate change tend to undertake action to reduce its impact.

Discussion

This research benefits the new information on the effect of climate change awareness, knowledge, and concern on adaptive and mitigating behaviors in the Sargodha City. The fact that most of the representatives of the sample are young and educated individuals (particularly, the students) shows that young people are increasingly aware of the climate problems. A good proportion of the respondents claimed to understand what climate change was all about and was concerned of its impact, especially, in their immediate geographical region. Previous research shows that those facing the quality of the environment in the cities (and, in particular, those with access to media and education) are more prone to be environmentally aware (Whitmarsh, 2009; Leiserowitz et al., 2020).

The analysis of correlation demonstrated that there was a weak relationship between awareness and real climate-related practices despite the high level of awareness (Abubakar et al., 2023). It means that making any sense of action does not always happen because of climate change awareness. This follows the so-called knowledge-action gap which has been reported in literature, and results as individuals become aware of the problem in the environment but yet they fail to change their behavior due to the knowledge (Kollmuss & Agyeman, 2002). Conversely, climate change concern and mitigation and adaptation strategies had moderate, and statistically significant correlation. It is proposing that as opposed to general awareness or factual knowledge, the factor that would influence behavior change more is emotional engagement or perceived seriousness of the problem. Moreover, despite having a rather small impact on the explanation of variance in adaptation and mitigation measures, knowledge of climate change was found to be a substantial reducing factor concerning behavior as found in the regression analysis. This finding shows that knowledge may be a necessary condition of behaving in a climate-friendly fashion but it is not sufficient. People may not want to take action despite being informed, and they may lack the motivation, the ability and sense of behavioral control to respond to the facts of climate change. These findings confirm the principles of the Theory of Planned Behavior (Ajzen, 1991) which emphasizes the role of social norms and perceived self-efficacy as well as attitudes and knowledge in the behavior.

The effect of other contextual and psychosocial factors is also revealed through the relatively weak explanatory capacity of awareness and knowledge. Having fears and being aware of the problem, some barriers such as cultural predisposition, the unavailability of infrastructure, financial insecurity, or limited access to climate-tolerant technologies, can interfere with behaviour change even among individuals who care and are aware of the situation. This may be related to things such as inappropriate urban planning, inconsistency in enforcing policies, and the irregularity

of the involvement of people in the case of Sargodha, which is a semi-urban city, but also a city that is becoming more vulnerable to the climatic conditions. These systemic limitations can explain the low behavioral results of the study and could also decrease individual effort effectiveness.

Crucially, these results highlight the necessity of localized and focused climate communication tactics that go beyond awareness-raising. Deeper emotional engagement, increased perceived efficacy, and tangible, easily accessible action options are all goals of interventions. Community projects, educational initiatives, and public campaigns must be created in a way that speaks to the lived experiences of the local populace, especially in places where institutional capacity is limited but climate change is becoming more and more noticeable. Public engagement with climate change requires both knowledge and awareness, but concern seems to be a stronger incentive for action. However, a complex interaction of structural, social, and individual factors shapes climate-related behaviors. Therefore, to improve community-level responses to climate change in Sargodha and comparable contexts, future policies and programs should take an integrated approach that incorporates information sharing with behavioral incentives, infrastructure support, and participatory planning.

Conclusion

Overall, the results show that although respondents' awareness and concern about climate change are relatively high, these emotional and cognitive reactions do not always result in noticeable behavioral change. The study emphasizes that in addition to knowledge, adaptive and meditative behaviors are significantly shaped by personal concern and emotional engagement. However, there has been little change in behavior, indicating that informational efforts are not enough on their own. A more all-encompassing strategy is needed for effective climate change responses, one that tackles motivational factors, boosts perceived self-efficacy, and establishes enabling environments that encourage and maintain climate-positive behavior.

Recommendations

The studies' findings allow for the recommendation of a number of realistic, human-centered strategies that could be used to improve the community's resilience and climate-related behavior. First and foremost, climate education must incorporate not only textbook-based instruction but also hands-on activities like workshops and community discussions that encourage learning from real-world experiences and introspection. Mentioning the ways that climate change may affect people locally, such as rising temperatures, altered rainfall, or health issues, can create emotional appeal and a stronger sense of internal responsibility. At the same time, people should be given inexpensive tools and easily accessible methods that enable them to adapt to the demands of their environment.

Furthermore, it is anticipated that future research will be presented with a greater emphasis on the institutional, social, and emotional factors that affect how people respond to climate issues. In order to ensure that the climate-related solutions implemented are not token, biased, or ineffective, any future plan should be deliberate and include the impacted groups, such as women, minorities, and people with disabilities.

References

Abubakar, A., Rasheed, S., Ahmed, T., & Shahid, M. (2024). Climate change and urban vulnerability in Pakistan: A focus on mid-sized cities. *Environmental Sustainability Review, 12*(1), 45–60.

Abubakar, M., Fatima, Z., Rehman, M. S. U., & Naz, F. (2023). Behavior and attitude of university students towards environmental issues. *Southern Journal of Social Sciences, 1*(1), 5–15.

Abubakar, M., Zaryab Fatima, Riaz, N., Khursheed, A., & Imtiaz, A. (2024). Psychological and behavioral effects of smog on university students. *Journal of Applied Research and Multidisciplinary Studies, 4*(2), 67–78. https://doi.org/10.32350/jarms.42.04

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Arbuckle, J. G., Morton, L. W., & Hobbs, J. (2013). Perspectives of Iowa farmers on climate change and their support for mitigation and adaptation efforts. *Climatic Change, 118*(3–4), 551–563. https://doi.org/10.1007/s10584-013-0700-0

Bord, R. J., O'Connor, R. E., & Fisher, A. (2000). Public comprehension of climate change: An examination of how much understanding is necessary. *Public Understanding of Science, 9*(3), 205–218. https://doi.org/10.1088/0963-6625/9/3/301

Intergovernmental Panel on Climate Change. (2023). *Synthesis report of the Sixth Assessment Report (AR6)*. IPCC. https://www.ipcc.ch/report/ar6/syr/

Kabir, M. I., Rahman, M. B., Smith, W., Lusha, M. A. F., & Milton, A. H. (2016). A baseline study on climate-related health impacts in Bangladesh. *Global Health Action, 9*(1), 29609. https://doi.org/10.3402/gha.v9.29609

Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally, and what are the barriers to pro-environmental behavior? *Environmental Education Research, 8*(3), 239–260. https://doi.org/10.1080/13504620220145401

Lee, T. M., Markowitz, E. M., Howe, P. D., Ko, C. Y., & Leiserowitz, A. A. (2015). Predictors of public climate change awareness and risk perception around the world. *Nature Climate Change, 5*(11), 1014–1020. https://doi.org/10.1038/nclimate2728

Leiserowitz, A. (2006). How affect and imagery influence climate change perception and related policy choices. *Climatic Change, 77*(1–2), 45–72. https://doi.org/10.1007/s10584-006-9059-9

Leiserowitz, A., Maibach, E., Roser-Renouf, C., & Smith, N. (2020). *Public attitudes and knowledge on climate change in the U.S.: Yale Climate Communication Report*. Yale University.

Mirza, M. M. Q. (2011). Climate change and the developing countries: Vulnerability, adaptation, and policy options. *The Pakistan Development Review, 50*(4), 441–456.

Moser, S. C., & Ekstrom, J. A. (2010). Identifying obstacles in adapting to climate change: A systematic assessment framework. *Proceedings of the National Academy of Sciences, 107*(51), 22026–22031. https://doi.org/10.1073/pnas.1007887107

Mustafa, D., Ahmed, S., Saroch, E., & Bell, H. (2015). Cultural influences on climate change adaptation in South Asia: Insights from Pakistan and India. *Climate and Development, 7*(3), 218–228. https://doi.org/10.1080/17565529.2014.975191

Nadeem, K., Yaseen, Z., & Muzaffar, M. (2023). Climate Change and Global Boiling: An Understanding. *Annals of Human and Social Sciences*, *4*(3), 857–873. https://doi.org/10.35484/ahss.2023(4-III)79

O'Connor, R. E., Bord, R. J., & Fisher, A. (1999). Environmental concern, climate risk beliefs, and willingness to take action. *Risk Analysis, 19*(3), 461–471. https://doi.org/10.1111/j.1539-6924.1999.tb00421.x

Pakistan Meteorological Department. (2024). *April 2024 climate overview*. Government of Pakistan.

Rasul, G., Mahmood, A., Sadiq, S., & Khan, S. I. (2022). Trends and variability of climate extremes in Pakistan. *Pakistan Journal of Meteorology, 19*(37), 1–14.

Safi, A. S., Smith, W. J., & Liu, Z. (2012). Rural Nevada and climate change: Vulnerability, beliefs, and risk perception. *Risk Analysis, 32*(6), 1041–1059. https://doi.org/10.1111/j.1539-6924.2012.01742.x

Schäfer, M. S., & Painter, J. (2011). *Climate change in the media: Reporting risk and uncertainty*. Oxford University Press.

Semenza, J. C., Hall, D. E., Wilson, D. J., Bontempo, B. D., Sailor, D. J., & George, L. A. (2008). Climate change awareness, voluntary action, and obstacles to behavioral change in the U.S. *American Journal of Preventive Medicine, 35*(5), 479–487. https://doi.org/10.1016/j.amepre.2008.08.020

United Nations Framework Convention on Climate Change (UNFCCC). (2021). *The Paris Agreement*. https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

Van der Linden, S. (2015). The social-psychological determinants of climate change risk perceptions: Towards a comprehensive model. *Journal of Environmental Psychology, 41*, 112–124. https://doi.org/10.1016/j.jenvp.2014.11.012

Whitmarsh, L. (2008). Direct experience with flooding and its role in shaping climate change risk perception and behavior. *Journal of Risk Research, 11*(3), 351–374. https://doi.org/10.1080/13669870701552268

Whitmarsh, L. (2009). Behavioral responses to climate change: Asymmetry of intentions and impacts. *Journal of Environmental Psychology, 29*(1), 13–23. https://doi.org/10.1016/j.jenvp.2008.05.003