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Role of Traditional and Cultural Behavior in Climate Change Adaptation in Pakistan

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Abstract:

The main objective of this study is to assess the influence of cultural and traditional behaviors on climate change adaptation in Pakistan. For this purpose, data were gathered using a questionnaire administered to 200 participants from diverse professions such as medicine, law, and education in Multan, Lahore, and Sahiwal divisions. 5-points Likert scale and Multiple Regression analysis were used to determine relationship between tradition, culture and climate change adaptation. The study found that cultural beliefs and values play a pivotal role in forming individuals' perceptions about climate change and influence their adaptive behaviors. These findings have valuable insight for policy makers to formulate effective climate change adaptation policies to prevent climate-related disasters.

Key words: Traditions; culture; human behavior; natural disasters; climate change adaptation.

Type of study: Original research Article.

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1. Introduction:

1.1 Background of study

Asia-Pacific region is more vulnerable and is the most effected due to climate change because temperatures are rising more than two times in Asia than in other region of the world on account of frequency and severity of climate-related natural disasters. In 12919, India was hit by severe heat wave, resulting in water shortage. Large scale population displacement was occurred due to torrential rains while water level is rapidly falling in the Mekong Delta due to dry weather that caused historic bushfires in Australia. More than 25 tropical cyclones wreaked damage on the Pacific and Indian Ocean coast and such climate hazards are likely to intensify in the future. Rising sea level from the global warming are eroding fertile arable soil in low-elevation coastal zone, posing a severe threat to rural incomes, commodity exports and food security. Rising waters will impact about one billion people in the Asian-Pacific regions. Big metropolitans like Mumbai, Dhaka, Karachi, Bangkok, Ho Chi Minh, Jakarta and Shanghai can face the risk of submerging. Many countries facing such threat of submerging their megacities are planning to shift their population to other areas to save their population from devastating floods. The vulnerability of different regions due to climate change is shown in

This region is also producing half of the World's carbon dioxide (CO_2 emissions), besides producing greenhouse-gas-emitting five times and in this way this region has significant share in current emissions. In order to control such high level of emissions growth China, India, Pakistan and other large CO2 emitting countries are taking policy initiatives. Greenhouse gas emissions are rising due to coal-based power plants and carbon-intensive manufacturing industries such as steel and cement, motor vehicles, agriculture,

and domestic cooking and heating), resulting in harmful high levels of particulate matter in the air (McKinsey Global Institute, 2020). Delhi, Dhaka, Ulaanbaatar, Kathmandu, Beijing, Jakarta, Lahore and Karachi are among today's 10 most polluted cities. The excessive use of fossil fuels is contributing into the mortality and respiratory diseases in the developing Asian countries. Climate change causes low growth, productivity, livelihoods and well-being across all Asian countries. The policy makers are working hard to mitigate the effects of climate change and adaptation efforts, using fiscal policy to manage policy trade-offs and ease the transition to a low-carbon economy (Alonso and others 2021) as these countries are members of 2015) Paris Accord. China has set zero emission goal by 2060, while Japan and Korea have committed achieve this goal by 2050. The transition to a low-carbon economy needs change in production and consumption patterns, transformation of energy, transport and cultural behavior of people to exploit natural resources and use agriculture land efficiently. IMF 2019) proposed imposition of carbon tax to reduce CO_2 emissions. The Vietnam, which is the most hazard country of the world due to excessive use of fossil fuels has introduced a carbon tax of $25 to achieve targets of Paris Accord 2015 in next decade.

The revenue to be generated from carbon tax of about one percent of GDP could lead to finance adaptation and mitigation plans. IMF (2019) estimates that about 68-80% of emissions are produced from coal in India, China, Pakistan, Bangladesh and Vietnam. India's coal tax, introduced in 2010 and doubled in 2020, could be further enhanced. Implementing a coal tax equivalent to $25 a ton could save about three million lives by 2030 in China alone. This tax is moderately regressive and will born by poor in China, Pakistan and Magnolia, but moderately progressive in India because of

transfer of tax money to vulnerable communities. Ahmed & Scholz, (2020). The amount of carbon tax may be spent on green transport, unemployment benefits and creating more jobs in low-carbon sectors. But the problem in the developing countries of Asia is that people are reluctant to quit their traditional behavior towards renewable energy sources and continue to spoil the environment (Norris, Nozkai, Daniel (2021). The major hurdle in moving to low carbon emission is lack of availability of green finance and financial incentives to business firms and people. Ali, et al. (2017). The ability to adapt to low carbon emission and adaptation is weak in Asian developing countries. Changing cultural behavior and improving the adaptative capacity to reduce the effects of severe climate hazards and natural disasters are essential for all countries. The prerequisites are developing early warning systems, building resilient infrastructure, reducing exposure, and ensuring the availability of financial mechanism. Gaps in adaptive capacity, however, remains large for Pacific countries, such as Vanuatu and Tonga, as well as for developing economies such as Pakistan, Bangladesh, Indonesia, and Philippines. Adaptation is also likely to entail tough choices about what to protect and what to relocate, as well as how to safeguard the most vulnerable populations. Adaptation is likely to entail tough choices about what to protect and what to relocate due to fiscal constraints. Some Asian countries need 3.3 % of GDP annually while some countries like Tonga, Laos and Philippines needs 14% of GDP for climate-proofing infrastructure for a decade. Such high costs cannot be borne by foreign debt-strapped Asian countries like Pakistan. Most of the countries have limited fiscal space and they cannot launch large scale efforts to low carbon environment (Salik, 2015).

1.2 Effects of Climate change on Pakistan

Pakistan has been suffering huge financial, human and infrastructure losses due to natural calamities. In the last quarter of 2022, a devastating flood and heavy rains caused 1600 deaths, about 2. million people displacement and US$15 billion infrastructure losses. It has disastrous effect on Pakistan's economy and hamper the process of sustainable development. The repeated natural calamities due to climate change attracted the researchers to investigate traditional and cultural behavior about climate change adaptation particularly in the underdeveloped countries where traditional and cultural practices are deep-rooted. Specially in Pakistan, traditional and cultural behavior plays a vital role in climate change adaptation because the people are not willing to abandon their traditional and cultural behavior practices and continue to resist any change to keep the environment clean or take precautionary measures to cope with natural disasters. So, the author has intended to explore how traditional and cultural practices can be leveraged to accelerate climate change adaptation in Pakistan, keeping in view the existing challenges and future opportunities. This research study is expected to contribute significantly to the existing body of knowledge on climate change adaptation and will likely to integrate traditional and cultural practices with the strategies being adopted for climate change adaptation in Pakistan. The introduction of new technologies has often forced the people to quit their traditional and cultural behavior (Naz, et al. (2022). Despite existing strong challenges, it is largely felt that traditional and cultural practices have significant role in clime change adaptation in Pakistan. The national climate change policy formulated in 2012 has recommended that traditional knowledge must be integrated with climate change adaptation planning. Several NGOs and research organizations are

working to motivate the people to abandon traditional practices and integrate them into adaptation planning. But no effective results have so far been achieved. In short, it has been proved that climate change is an international issue and most of Asian developing countries are facing this critical issue, which is hampering their economic growth, livelihood and population displacement. Pakistan is among those countries which are prone to this threat. There is a large gap in literature to investigate the causes and effects of climate change and its mitigating strategies. The novelty of this study is that there is dearth of research on the role of traditions and culture in climate change adaptation. The current study will explore the answer to the following questions: what are the effects of climate change? What are the challenges of adapting to environmental change? What is the role of culture and traditional in climate change adaptation? The answers of these questions will help in devising effective planning to mitigate the disastrous effects of climate change and promote sustainable economic development. Thus, the traditions and culture are two significant factors that need in depth investigation to mitigate climate-related calamities and to ensure food security in future.

2. Literature review

Climate change is a pressing global issue that has far-reaching implications for various sectors, including agriculture, environment, and the economy. This literature review examines recent research on the challenges and impacts of climate change in Pakistan, with a particular focus on the food and agriculture industries. The review also highlights gaps in the existing literature and identifies areas for future research, emphasizing the need for comprehensive studies on climate change adaptation challenges and opportunities.

2.1 Challenges Posed by Climate Change:

Mehmood (2022) and Mahmood (2018) emphasized the challenges that climate change poses to environmental sectors, with a specific emphasis on the food and agriculture industries. Ajani and van der Geest (2021) conducted research on how Pakistan's diverse geographical landscapes have been affected by climate change. Fahad & Wang (2020), assessed Pakistan's susceptibility to droughts and floods due to climate change, evaluating the effects of environmental change and adaptation policies. These studies collectively underline the challenges faced by Pakistan in the wake of climate change, particularly in sectors vital to its economy. Ahmad, et.al. (2020)

2.2 Sectoral Impacts of Climate Change:

Numerous studies, including those by Hussain et al. (218, 2020) and Iqbal (2020), delved into the sectoral consequences of environmental change and adaptation approaches in Pakistan. Ahmed, Shahid, and Nawaz (2018) analyzed the impact of climate change on drought characteristics, emphasizing the connection between temporal scarcities, rainfall, and heat. Jan et.al. (2020) and Khan et al. (2016) and investigated the prevalence and capacity consequences of climate change, evaluating the integration of weather-related matters into national regulations and strategies. These studies highlight the sector-specific implications of climate change, particularly in agriculture, water resources, and disaster management.

2.3 Gap in the Literature:

Despite the valuable insights provided by the existing studies, a significant gap in the literature becomes evident. Most studies focused on the impact of climate change on individual sectors, such as agriculture, livestock, forestry, and water resources. While these sector-specific studies are crucial,

there is a notable absence of comprehensive research that explores the economic implications of climate change adaptation in Pakistan. Moreover, limited attention has been given to evaluating the effectiveness of adaptation policies and measures in mitigating the negative effects of climate change on Pakistan's economy. Existing research tends to highlight challenges without delving into potential opportunities and strategies for adaptation.

2.4 Opportunities for Future Research:

To address these gaps, future research should consider comprehensive studies that examine the economic implications of climate change adaptation in Pakistan. Such studies could encompass various sectors and evaluate the potential benefits and challenges of adaptation strategies. Additionally, there is a need for more in-depth research that assesses the effectiveness of adaptation policies and measures in safeguarding Pakistan's economic growth. The reviewed literature underscores the challenges and impacts of climate change in Pakistan, particularly in the agriculture and food sectors. However, there is a clear gap in the literature concerning comprehensive research on climate change adaptation challenges and opportunities. Future studies should aim to provide a more holistic understanding of the economic implications of climate change adaptation in Pakistan, with a focus on evaluating the effectiveness of adaptation policies and measures. Addressing these research gaps is essential for developing informed strategies to mitigate the adverse effects of climate change on Pakistan's economy.

In the light of reviewed literature, the author has formulated the following hypotheses to measure the impact of tradition and cultural behavior on climate change adaptation in Pakistan: -

Ho: Traditional and cultural behavior has no role in climate change adaptation.

H_1: Traditional and cultural behavior has significant role in climate change adaptation.

Ho: There is no relationship between traditions, culture and climate change adaptation.

H_1: There is a strong relationship between tradition, culture and climate change adaptation.

3. Data and Methodology

In order to understand traditional and cultural behavior of people about climate change in Pakistan a questionnaire was developed and primary data was collected from 200 respondents, who were selected through random sampling method. The respondents belonged to three main big cities of Pakistan such as Multan, Lahore, and Sahiwal and working in different professions like medicine, law and education. Among 200 participants of this study, there were 117 females and 83 were males having age between 20-50 years. The questionnaire was structured on the basis of 5-points Liker Scale, which is an authentic tool, to measure the attitude of respondents about any issue. The reliability and validation of questionnaire was checked through pilot testing. Only the most reliable statements were selected after pilot testing. The data collection took about six months from April 2022 to September 2022. The field survey method was used for having face-to-face interviews and questionnaire filling. "SPSS" software was applied to draw the results. Chat-GPT-4 was used to improve the language of this paper. The selected variables of this study include Change in the earth's temperature, linkage of Human activities with temperature, Effects of climate change on people's lives, link between Environment and modern life, Relationship between Climate change

and natural disasters, Rising emission and climate change, Role of Plantation in controlling climate change, climate disasters increases human sufferings, Climate disasters increases human sufferings and effects of climate change on people's behavior. Different statistical techniques like percentage, descriptive statistics, correlation matrix and multiple regression analysis were used to analyze the data and to determine relationship between variables of this study.

4. Results

4.1 Demographic Analysis:

Various statistical methods such as demographic statistics reliability test, descriptive statistics, Pearson correlation and multiple regression analysis, were used to analyze data. We start our analysis first from demographic characteristics of participants and these characteristics are calculated through frequency and percentage.

The gender of participants is presented in Table 1.:

Table 1

Gender of respondents

Gender	**Frequency**	**Percent**
Male	83	41.5%
Females	117	58.5%

Table 1 depicts that the sample constituted 58.5%, female and 4.5% male respondents. In this way, majority of respondents are female. Maximum females are likely to be strongly affected by climate change, as most of rural females work in the agriculture fields, which is very sensitive to the

environment. Furthermore, it was found that females are more vulnerable during life-threatening environmental disasters than male.

The age of participants is presented in Table 2.

Table 2

Age of Respondents

Age of participants	**Frequency**	**Percent**
18 to 25 years	44	22%
26 to 35 years	98	49%
36 to 50 years	52	26%

The data in Table 2. reveals the age groups of participants. Among them 22% of respondents were in the age group of 18-25 years, 49% were 26-35 years, and 26% were in the age group of 36-50 years. The majority of respondents are between the ages of 26 and 30, showing that climate change is a relative age factor. The level of education of the participants are given in Table 3.

Table 3

Level of Education of participants

Education **levels**	**Frequency**	**Percent**
Intermediate	33	16.5%
Graduation	69	34.5%
Masters	73	36.5%
M.Phil.	20	10.0%
Ph.D.	5	2.5%

Table 3 depicts that 16.5% of respondents are youth, having an education of intermediate, while 34.5% were graduates. 36.5% post-graduate, 10.0% were MPhil and 2.5% were Ph.D. in different disciplines. The majority of the

respondents hold graduate degree. Education levels can also go parallel with levels of youth awareness of climate change and Education is the primary determinant of socioeconomic status and increases the varying quality of this human capital.

The monthly income of participants are highlighted in Table 4.

Table 4

Monthly Income of participants (in Pak Rupee)

Monthly income	**Frequency**	**Percent**
Rs.10,000 to Rs.20,000	12	6%
Rs.21,000 to 30,000	71	35.5%
Rs.31,0000 to 40,000	74	37%
Rs. 41,000 to Rs. 50.000	43	21.5%

Table 4 depicts that most of the respondents (37.0%) had monthly income between Rs.310000 to Rs.40000, while 35.5% of the respondent's income was between Rs.21000 to Rs.30000, 6% of respondents had monthly income between Rs. 10000 to Rs.20000, and 21.5% respondents had income between Rs. 40000/- to Rs. 50000/- The monthly income all participants were between Rs.10000 to Rs.50000 and this income level shows that all participants belong to poor families.

The professions of participants are shown in the following table.

Table 5

Professions of respondents

Categories of participants	**Frequency**	**Percent**
Students	75	47.5%
Teachers	38	14%
Entrepreneurs	48	20%
Others	39	19.5%

Table 5 shows that 47.5% of participants were students,14% of respondents were teachers. 20% were engaged in different businesses and 19.5% of respondents were medical doctors, lawyers' or unemployed. Data show that a significant majority of the respondents was students who give a response about climate change affecting their personal life and traditional behavior.

4.2 Analysis of statements

A questionnaire was structured and primary data was collected from 200 participants who were selected through random sampling method. The questionnaire contains different statements about climate change adaptation and the participants were asked to give their opinion about them and their response was rated through 5-points Likert Scale. The first statement was that there was a change in earth's temperature. The response of participants is given in the following table.

Table 6:

Change in the earth's temperature

Response of participants	**Frequency**	**Percent**
Strongly Agree	30	15 0%
Agree	105	52.5 %
Neutral	10	5.0%
Disagree	40	20.0 %
Strongly disagree.	15	7.5%
Total =	200	100%

The results in Table 6. shows that 52.5% of participants were agree and 15% were strongly agree that change in climate is due to increase in the Earth's surface temperature. However, 5% participants show neutrality while 27.5% participants strongly opposed that earth temperature changes due to climate change. Anyhow, majority of the participants supported the idea that earth temperature (Global warming) is rising due to climate change.

The second statement was that human activities have no linkage with temperature. In other words, human activities have no effect on temperature. The response of the participants is given in the following table.

Table 7

Human activities have no link with temperature

Response of participants	**Frequency**	**Percent**
Strongly Agree	58	29%
Agree	100	50%

Neutral	13	6.5%
Disagree	28	14%
Strongly Disagree	10	0.5%
Total =	200	100%

Table 7 shows that 50 % participants were agreed that human activity does not have a significant effect on climate change while 29% were strongly agree with this contention. However,6.5% respondents were not given their views on this issue. In contrast, 14% of respondents showed disagreement with this statement and 5% respondents also strongly opposed it. Thus, the majority of the participants stated that human activities have no significant impact on climate change.

Third statement was that whether climate change affects the lives of people. The answers are given in the table below.

Table 8

Climate change affects the lives of people

Response of participants	**Frequency**	**Percent**
Strongly Agree	5	2.5%
Agree	16	8%
Neutral	15	7.5%
Disagree	105	52.5%%
Strongly Disagree	54	0.45%
Total =	200	100%

Table 8 depicts that only 10.5% participants were agreeing and strongly agree with the statement that climate change affects people's lives while 52,5%

opposed it and only 7.5% of participants did not give their opinion. Thus, majority of participants did not support the idea that climate change affects the lives of people. These views highlight the traditional and cultural behavior of people in Pakistan where majority of the people think that climate change is a natural phenomenon and it does not affect their lives.

The fourth statement was that the people are too selfish to do anything to mitigate the effects of climate change adaptation. The answers are given in the following table.

Table 9:

People are too selfish to do anything to mitigate the effects of climate change

Response of participants	**Frequency**	**Percent**
Strongly agree	2	0.7%
Agree	100	50%
Neutral	16	8%
Disagree	80	41.5%
Strongly disagree	1	0.5%
Total =	200	100%

Table 9: shows that 57% of respondents were agreed and strongly agree that individuals are also self-centered to do anything or to contribute into the efforts to reduce the effects of climate change. They don't feel that they have social and legal obligations to take measures to minimize the effects of climate change. However, about 43% of participants were disagreed and stated that it is the responsibility of people to take preventive measures to mitigate the effects of climate change. However, the majority of participants show traditional and cultural behavior towards climate change and take climate

change as uncontrollable phenomenon and show unwillingness to participate in climate change adaptation campaign in Pakistan.

The fifth statement was that the government should provide fiscal incentives to keep the environment clean. The answers are shown in the following table.

Table 10:

Government should provide fiscal incentives for clean environment

Response of participants	**Frequency**	**Percent**
Strongly Agree	5	2.5%
Agree	16	6.5%
Neutral	5	2,5%
Disagree	120	60%
Strongly Disagree	54	27%
Total =	200	100%

Table 10 shows that out of total 200 respondents, 60% disagreed and 27% also strongly disagree with contention that government should provide fiscal incentives for motivating the people to keep environment clean while around 10 % participants opposed it, saying that the government should provide fiscal and other incentives for promoting clean environment. The majority of respondents opposed government incentives for clean environment and argued that the people should voluntarily participate anti-environmental pollution campaign.

The sixth statement was that whether environmental issues are the result of modern life. The opinions of the participants are given in the following table.

Table 11

Environmental issues are the results of modern life

Response of participants	**Frequency**	**Percent**
Strongly Agree	2	1%
Agree	58	29%
Neutral	8	4%
Disagree	94	47%
Strongly disagree	46	23%
Total =	200	100%

Table 11 shows that 70 participants% were disagree and strongly disagree that environment issues are the results of modern life while around 30%% of respondents were agreed that current environmental issues are the results of modern life which demand excessive use of natural resources. Thus, majority of the participants of study think that environmental issues have no link with modern life and its requirements.

The seventh statement was that climate change causes floods and natural disasters. The views of participants are presented in the table below.

Table 12

Climate change causes floods/natural disasters

Response of participants	**Frequency**	**Percent**
Strongly agree	85	42.5%
Agree	80	40%
Neutral	4	2%

Disagree	21	10.5%
Strongly disagree	10	5%
Total =	200	100%

Table 12 shows that 82.5% participants were agreed and strongly agreed that floods and natural disasters are occurred on account of climate change while 15.5 percent opposed it. However. Majority of respondent were realized that floods and natural calamities are occurred due to climate change. It highlights how people realize the effects of climate change.

The eighth statement was that rising emissions are the main cause of climate change. The views of participants are highlighted in the following table.

Table 13

Rising emission is the main cause of climate change

Response of participants	**Frequency**	**Percent**
Strongly agree	26	13%
Agree	102	51%
Neutral	10	5%
Disagree	47	23.5%
Strongly disagree	15	7,5%
Total =	200	100%

Table 13 shows that 64. % Respondents were agreeing and strongly agree that rising level of emission causes climate change while five percent respondents

did not give any opinion. However, 31% responded opposed it, saying that climate change has no link with rising emissions level, which, according to their point of view, is a natural phenomenon.

The ninth statement was that planting trees help fight climate change. The answers are given in the following.

Table 14:

Planting trees help to fight climate change

Response of participants	**Frequency**	**Percent**
Strongly agree	93	46.5%
Agree	80	40%
Neutral	11	5.5%
Disagree	14	7%
Strongly disagree	2	1%
Total =	200	100%

The data in Table 14 shows that about 86.5% of respondents were agree and strongly agree that planting trees helps fight climate change while 5.5% shows neutrality and only 8% respondents opposed this statement. They were not agree with this contention that planting trees prevent climate change.

The tenth statement was that climate disasters increase human suffering. The views of participants are presented in the table below.

Table 15.

Climate disasters increase human suffering.

Response of participants	**Frequency**	**Percent**

Agree	90	45%
Strongly Agree	75	37,5%
Neutral	5	2.5
Disagree	16	8%
Strongly disagree	14	7%
Total =	200	100%

Table 15 shows that 82.5%% participants were agree and strongly agree that climate disasters increase human sufferings and displacements. However, 15% respondents were not agreed with this statement that climate disasters enhance human sufferings and economic loss. Only 2.5% were reluctant to give any opinion on this issue due to lack of knowledge or awareness about climate change adaptation.

The eleventh statement was that climate change has effect on people's behavior. The answers to these statements are highlighted in the following table.

Table 16

Climate change brings effect on people's behavior

Response of participants	**Frequency**	**Percent**
Strongly Agree	100	50%
Agree	77	38.5%
Neutral	4	2%
Disagree	11	5.5%

Strongly disagree	8	4%
Total =	200	100%

The results in Table 16 shows that 88.5%% participants were agree and strongly agree that climate change has effect on the behavior of the people and they feel that they have been suffering financial and ecological losses due to climate change. As a result of this realization people take precautionary measures to save themselves from possible climate disasters in future by building earthquake-resistant buildings for their own safety and safety of their other valuable assets. However, 19% respondents opposed it, saying that climate change has no effect on people's behavior. This class represents those who is addicted to their old traditions and culture and are reluctant to change their behavior. Thus, it has proved that majority of respondents think that climate change affects people's behavior and force them to control emission or avoid to be involved in polluting activities.

4.2 Empirical results:

4.2.1 Descriptive statistics

The descriptive analysis is used to describe the behavior of variables through means and standard deviation. The variables, their means and standard deviations are shown in the following table.

Table 17

Results of descriptive Statistics of variables

Statements based on variables	**N**	**Mean**	**Std. Deviation**
Change in the earth's temperature due to climate change.	200	1.8600	.65770

Human activities have no link with temperature	200	2.0100	.64962
Climate change affects the lives of people	200	3.1400	.65770
Environmental issues are the consequence of modern life	200	2.9200	.74591
Climate change causes natural disasters	200	1.6800	.65555
Rising emission is the main cause of climate change	200	2.1050	.59645
Planting trees help to fight climate change.	200	1.6000	.49113
Climate disasters increases human sufferings.	200	1.5800	.63689
Climate change has effects on people's behavior	200	1.4950	.60148

Table 17. shows the mean, and standard deviation of (Nature fluctuation in earth's temperature, its impact on global temperature, Health issues, Consequences of modern life, Flooding, human suffering economic and ecological damage, and influence on people's behavior and motivation. The mean score and standard deviation of change in people's behavior due to climate change are too much high than other variables of the study.

4.2.2 Correlation Matrix:

A correlation matrix highlights nature of relationships between variables, allowing researchers to identify potential patterns or relationships between them. By examining the correlation between two variables, the researcher can determine whether there is a positive, negative, or no relationship between them. Correlation matrices are also used in data analysis to identify multi-collinearity, which occurs when independent variables are highly correlated with each other. In this case, the correlation matrix can help researchers identify which variables are most highly correlated, and decide which

variables should be included in the regression model. Overall, correlation matrices are a valuable tool for researchers to examine the relationships between all pairs of variables. The results of correlation matrix of this study are shown in the following table.

Table 18:

Results of Correlation Matrix

Variable	Constant	Change in Earth's temperature	Climate change causes natural disasters	Pollution is the consequence of modern life	Human activities linkage with rising temperature	Climate change has effects on people's behavior	Climate disasters increase human sufferings
Constant	1.000	-	-	-	-	-	-
Change in Earth's temperature	-	1.000	0.073	-	0.024	0.072	0.060
Climate change causes natural disasters	-	-	1.000	-	-	-	0.777
Pollution is the consequence of modern life	-	-	-	1.000	-	-	-

Variable	Constant	Change in Earth's temperature	Climate change causes natural disasters	Pollution is the consequence of modern life	Human activities linkage with rising temperature	Climate change has effects on people's behavior	Climate disasters increase human sufferings
Human activities linkage with rising temperature	-	0.951	0.973	-0.811	1.000	-	-
Climate change has effects on people's behavior	-	0.001	0.023	0.419	0.046	1.000	-
Climate disasters increase human sufferings	-	0.001	0.008	-	-	-	1.000

Table 18 shows that there is positive and linear relationship between all pairs of variables. For example, change in earth temperature and climate change has positive correlation. Similarly, modern life has affected the level of pollution because it involves excessive use of resources. In the same way, there is a positive linkage between human activities and rising temperature. The global warming is the results of rising human economic activities. The correlation

matrix shows that climate change has significant impact on human behavior natural disasters enhance human sufferings. Thus, correlation matrix is symmetric.

4.2.3 Regression Analysis

To influence the effect of people's behavior and motivation on the professional side, environmental pollution, changing human activities, family planning, the key to climate adaptation, suffering economic and ecological damage. It influences people's behavior as dependent variables, and occupation, flooding, pollution, changing human activities, family planning, climate change adaptation, and suffering economic and ecological losses as independent variables. The Regression analysis is used to probe the nature of relationship between independent and dependent variables. Through this method we can predict how much variation is occurred in the dependent variable due to variation in independent variable. The results of multiple regression analysis of this study are given in Table 19.

Table 19:

Result of Multiple Regression Analysis

Variables	**B**	**Std. Error**	**Beta**	**T**	**Sig**
(Constant)	1.837	.313		5.861	.000
Change in the earth's temperature.	.072	.076	.073	.951	.001
Climate change causes natural disasters.	.080	.083	.074	.973	.023

Pollution is the consequence of modern life	-.079	.098	-.060	-.811	.419
Human activities linkage with rising temperature	.019	.058	.024	.325	.046
Climate change has effects on people's behavior.	.074	.078	.072	.948	.345
Climate disasters increases human sufferings.	.065	.083	.060	.777	.008
$R^2 = 0.025$					

The estimated regression model is written as

Nature fluctuation = 1.837 + 0.072 change in earth's temperature + 0.080 Natural disasters - 0.079 environmental issues and modern life + 0.019 human activities and temperature + 0.074 climate change adaptation and people's behavior + 0.065 climate disasters and human sufferings.

Table 19 show relationship between independent and dependent variables. All independent variables have positive relationship with dependent variable (climate change adaptation) except environmental issues and modern life which have negative association. The results reveal that one-unit changes in earth's temperature will likely to increase climate change adaptation by 72%. It is positive and significant relationship between two variables. The coefficient value of natural disaster indicates if one unit increases in natural disasters it will likely to cause climate change adaptation by 80%. It shows positive and significant relationship between natural disasters and climate change adaptation. The coefficient value of modern life shows if one unit

increases in modern life (living standard) it will likely to decrease level of environmental pollution by 79%. The coefficient value of human activities linkage with rising temperature highlights that if one unit increases in temperature it will likely to increase climate change adaptation by 19%. It means rising temperature forces the people to change their behavior towards climate change adaption and adjust their living behavior according to changing temperature to mitigate its effects on their lives. The coefficient value of climate change and people's behavior reveals if one-unit changes in climate change the behavior of people will likely to be changed towards climate change adaptation by 74%. It is positive and significant relationship between these two variables. It means that climate change has significant impact on people's behavior. The coefficient value of climate disasters and human sufferings also have positive association between variables. It means if one unit increases in climate disasters it will likely to increase human sufferings by 65%. When sufferings increase people will definitely change their behavior to climate change adaptation in order to reduce their suffering. In short, the multiple regression analysis suggests that all independent variables except relationship between pollution and modern life are significant predictor of the dependent variable, climate change adaptation. Thus, Null hypothesis is rejected and alternate hypothesis is accepted. But the value of R2 (coefficient of determination) shows that overall model explains very small proportion of change in the dependent variable.

5. Discussion:

The objective of this research study was to analyze the role of traditions and culture in climate change adaptation. For this purpose, primary data was

collected from 200 respondents, who were selected random sampling methods, from three big cities, Multan, Lahore and Sahiwal through a structured questionnaire during April-September 2022. The selected respondents belonged to different professions like medicine, law and education. and have sufficient awareness about local culture, traditions and the effects of climate change. The questionnaire was developed on the basis of 5-points Liker scale. The selected variables of this study include Change in the earth's temperature, linkage of Human activities with temperature, Effects of climate change on people's lives, link between Environment and modern life, Relationship between Climate change and natural disasters, Rising emission and climate change, climate disasters and human sufferings and effects of climate change on people's behavior. Different statistical techniques like percentage, descriptive statistics, correlation matrix and multiple regression analysis were used to analyze the data and to determine relationship between variables of this study. The results were calculated through SPSS software. The descriptive statistics analysis of variables shows that the mean score and standard deviation of change in people's behavior due to change climate are too much high than other variables of the study. The results of correlation matrix show symmetric relationship between pairs of variables. It means that all variables have positive and linear relationship with each other. The multiple regression analysis reveal that all independent variables have positive association with dependent variable (climate change adaptation) except environmental issues and modern life which have negative relationship with it.

The results reveal that one-unit changes in earth's temperature will likely to increase climate change adaptation by 72%. It is positive and significant relationship between two variables. The coefficient value of natural disaster

indicates if one unit increases in natural disasters it will likely to cause climate change adaptation by 80%. This is also positive and significant relationship between two variables. It means that natural disasters bring significant change in the behavior of the people about climate change adaptation. The coefficient value of modern life shows if one unit increases in modern life (living standard) it will likely to decrease level of environmental pollution by 79%. It means that when living standard of people is improved, they focus on controlling environmental pollution. The coefficient value of human activities linkage with rising temperature highlights that if one unit increases in temperature it will likely to increase climate change adaptation by 19%. It means rising temperature forces the people to change their behavior towards climate change adaption and adjust their living behavior according to changing temperature to mitigate its effects on their lives. The coefficient value of climate change and people's behavior reveals if one-unit changes in climate change the behavior of people will likely to be changed towards climate change adaptation by 74%. It is also positive and significant relationship between these two variables. It means that climate change has significant impact on people's behavior. The coefficient value of climate disasters and human sufferings also have positive association. It means if one unit increases in climate disasters it will likely to increase human sufferings by 65%. When sufferings of people increase, they must change their traditional and cultural behavior towards climate change adaptation in order to reduce their suffering. In short, the multiple regression analysis indicates that all independent variables except relationship between pollution and modern life are significant predictor of the dependent variable, climate change adaptation. But the value

of R^2 (coefficient of determination) shows that overall model explains very small proportion of change in the dependent variable. It shows that Pakistani society is slowly moving towards climate change adaptation due to tradition and culture despite large human and financial losses due to natural disasters.

6 Conclusions and policy implications

Based on the above discussion, it can be concluded that culture and tradition play significant role in the climate change adaptation in Pakistan. The study identified various cultural and traditional practices that are utilized by communities to cope with the impacts of climate change, such as community-based disaster risk reduction strategies, reliance on traditional knowledge, and social networks. Additionally, it was noted that cultural beliefs and values are crucial in shaping people's perceptions of climate change and their attitudes towards adaptive behaviors. The traditions and cultural practices are so much strong embedded in the habits of the people that are not willing to abandon them easily. However, when natural disasters cause heavy human and financial losses then people are tended to reverted to climate change adaptation. It is strongly felt that there is an urgent need to convince people to adapt climate change through massive media awareness campaign. It will create sense among the people to realize the disastrous effects of climate change and create resilience against them by adopting clean technologies and less engaging in environmental polluting activities. It is also an urgent need to integrate the knowledge of traditions, culture and climate change adaptation so that these three factors move in the same direction to reduce human and financial loss and create a strong resilience against unpredicted natural calamities. During this research study it was found that there is sufficient gap between policy making and lethargic execution of environmental projects by the relevant institutions. The is not only a need for proactive policy framework

but also dynamic institutional mechanism to cope with the climate change adaptation challenges. This study suggests various policy actions for establishment of effective livestock disease surveillance mechanism at regional at community level and motivate farmers to adopt different corps pattern, improve climate forecast through effective media campaign and introduce crop insurance to protect the farmers against unforeseeable crop losses due to heavy floods, droughts and heavy rains.

This study can contribute into the existing literature on climate change in different ways. First, it reveals the vital role of cultural and traditional practices and emphasize their integration with climate change adaptation strategies in Pakistan. The author feels that there is sill gap in the literature to conduct further research in future by expanding sample size, geographical areas and comparing traditional and cultural practices in different regions of a country. Secondly, it is also noted that indigenous knowledge about traditions and culture are overlooked and policies are framed at higher level without giving them due consideration. The indigenous knowledge is valuable information that can help policy makers to frame policies for climate change adaptation. It will not only reduce resistance against top-down strategies but also create sense of participation among the local communities regarding the management of natural resources and adoption of clean technologies. Thirdly, it must be noted that the impact of climate change is not just environmental but it has substantial social and cultural impact and, therefore, there is need to adopt a more holistic approach about climate change adaptation strategies. Ins short, the findings of this study provide a valuable insight about the role of tradition and culture in climate change adaptation and its recommendations are also

valuable for environmentalists, policy makers, researchers and practitioners working in the area of climate change adaptation.

Data Statement:

The data that supports the findings of this study will be made available on request by corresponding author.

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