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Investigating Prospective Teachers' Behavioral and Campaign Attitudes about Climate Change in Pakistan.

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Abstract

The purpose of this research is to examine educator's perspectives on climate change. It emphasis on campaign and behavioral attitudes in Pakistan. The teaching about climate change and encouraging pro-environmental practices, teachers may be instrumental in preparing the next generation of environmental leaders. It is imperative that teacher education programs should focus on preparing prospective teachers for a sustainable future. The study utilized a selfdeveloped attitude assessment scale to measure climate change attitude among 308 prospective teachers, consisting of 49 male prospective teachers and 259 female prospective teachers. The results indicated the significant difference in attitudes towards climate change between male and female prospective. In these findings, it is recommended that teacher education programs in Pakistan should provide prospective teachers the opportunities to encourage pro-environmental attitude.

Keywords words: Climate Change, Attitude, Prospective teachers, Sustainable development education, SDG.13, climate change campaigns,

Introduction

The consequences of climate change are one of the dominant threats to the global environment that all individual is facing in this modern and tech-oriented era (Dervash et al., 2023) More specifically, education and campaign has the potential to facilitate shift that how individuals can address about climate change. As education for sustainable development is essential for raising awareness about climate change and building capacity for adaptation and mitigation (Dietz et al., 2020). The UN Conference on Climate Change (COP21) recognises the importance of education and campaigns in responding to climate change (Rhodes, 2016). Additionally, many researchers have emphasised the need to educate teachers about the impacts of climate change and sustainable development awareness related to reducing the global warming and greenhouse gas emissions, thereby creating a healthier ecosystem (Reid, 2019; Leal Filho et al., 2021.Adams (2021) outlines the contributions of critical societal and regional viewpoint on climate change that was reported

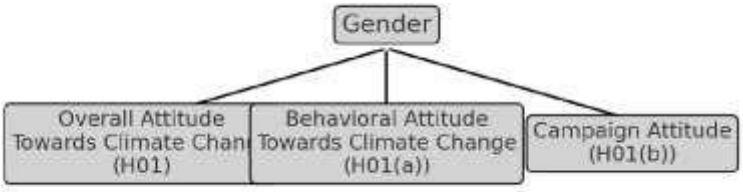
by UNESCO in the Platform of the Berlin Conference that a simple educational context was not able to provide enough knowledge regarding the environmental crises nor to adapt and respond to climate change. This gap was a significant barrier to incorporating climate change into the education system and in the context of Pakistan there was very little research evidence is available to know the teachers' attitude towards climate change as teacher education programme is still have no content included in the curriculum about climate related knowledge. Hence, special attention been given to prospective teachers as key stakeholders must be prepared for inspiring the sustainable development in education sector. Therefore, this study intention to analyse the male and female prospective teachers Behavioral and campaign attitudes about climate change at a higher level of education in Pakistan.

Objectives of the Study

The study focused on the following objectives.

1. To investigate the Behavioral attitude of prospective teachers about climate change at higher level of education.
2. To investigate the campaign attitude of prospective teachers about climate change at higher level of education.
3. To compare the attitudes of prospective teachers towards climate change based on gender at a higher level of education.

Figure No: 01 Framework of the study



Literature Review

Behavioural change is a crucial aspect of addressing climate change refers to the process of individuals and societies modifying their behaviours to reduce their environmental impact and contribute to climate change mitigation efforts (Berger 2015). Effective measures must be taken to address climate change; however, engaging has proven to be challenging due to the politicisation of science Also, Overs by (2015), mentioned that climate change is a complex issue that may be less motivating for students and instructors, primarily because of teachers' lack of confidence and insufficient training. Further, Marzetta (2016) simplifies climate literacy into three clearly defined key categories. 1. Affective (beliefs): attitudes, 2. values, and environmental responsibility; and 3. behaviours: habits and behaviours. The first category was concerned with the implementation of scientific knowledge and abilities to promote climate and environmental awareness. Another quantitative study was conducted by Eze and Nwagu (2021) investigated the capacity-building needs of 410 in-service faculty members in Enugu State. The findings revealed that teachers acknowledged a significant need for capacity building in climate change tactics.

Ambusaidi et al. (2012) stated that teachers should be capable of identifying effective mitigation strategies to mitigate. Climate change education and campaigns can help students to understand the importance of mitigation activities and encourage to reduce the waste and demand the use of renewable energy (Tolppanen & Aksela, 2018). Similarly, Khan and Hussain (2024) emphasised the significance of educating about climate change to enhance the effectiveness of mitigation and adaptation programs as well as to encourage civilian participation in mitigating and adaptation the strategies towards sustainability. Addressing climate change in the classroom can help to build the next generation behavioural attitude and skills to tackle the crisis and instil a sense of stewardship (Bush & Clayton, 2023). A study conducted by Li & Liu in 2022 in Taiwan regarding climate change and its attitude indicated that the students expressed a high level of certainty and concern about climate change. However, there was a lack of understanding regarding the underlying reasons for climate change and negative attitudes towards acting. The study also revealed that students' knowledge and attitudes towards climate change was minimal. Furthermore, McGimpsey et al. (2023) investigate how climate change education conflicts with the fundamental beliefs and transfer of theory and practice. Therefore, there was an emphasis on retaining the concept of climate change and teachers need to change their behaviour and attitude to achieve the goal of making learning about climate change interesting and impactful. Gustria and Fauzi (2019) incorporating climate change into physics instructional materials, aiming to analyse students' attitudes towards the climate change. The outcomes indicated that students had unfavourable attitude towards the climate change. Ochieng and Koske (2013) indicates knowledge gaps between primary school teachers and the general community regarding climate change. Chowdhury et al. (2021) argued that educators' Behavioral attitude of climate change can play a crucial role in addressing regarding climate change policies and environmental sustainability and highlighted the importance of offering instructors’ alternative approaches to sustainability and disaster education. Tolppanen and Kärkkäinen (2022) sought to determine the Behavioral attitude of preservice teachers that were reluctant to modify their lifestyles to reduce carbon emissions and particularly hesitant to modify their eating, driving, traveling routines and simplicity of action.

Research Methodology:

This research is designed as a survey based comparative study. It is a common type of social research that aims to accurately represent situations. Survey method is use to collect the data from respondents. The purpose of data collection a self-developed questionnaire administered by the researcher to achieve the research objectives. The population of the study is comprised of both male and female prospective teachers, who were pursuing higher education in four public universities in the twin cities of Islamabad and Rawalpindi. Furthermore, all prospective teachers enrolled and registered (1264) in the 4-year BS programme were included in the study's population. In the time being, identified as male (196) and female (1068) prospective teachers were selected from all public universities in Islamabad and Rawalpindi city as: 1. National University of Modern Language Islamabad; 2. International Islamic University Islamabad; 3. Fatima Jinnah Women University Rawalpindi; 4. Pir Mehar Ali Shah Arid Agriculture University Rawalpindi. Stratified random sampling was utilised to select the sample size from the target

population, with males and females being the primary strata for this study. The total sample are consisted of 308 prospective teachers, which represented 25% of the population (see table 1).

Data Analysis:

The collected data is analysed using statistical techniques, such as the mean and independent sample t-test, with SPSS version 24. The findings and conclusions were drawn based on the analysed results of questionnaires. Suggestions and recommendations were provided based on the research findings. The researcher collected data by distributing the instrument and personally visiting each of the four universities in the twin cities of Islamabad and Rawalpindi.

Table 1. Population and Sample of the study

Group	Population	Sample	Number of respondents
Male	196	49 (25 %)	48
Female	1068	259 (25%)	260
Total	1264	308(25 %)	308

The total population consisted of 1,264 individuals, with 196 males and 1,068 females. The sample size was determined to be 25% of the population for each gender group. As a result, the sample included 49 males (25% of the male population) and 267 females (25% of the female population). The final number of respondents who participated in the study was 48 males and 260 females, making up a total of 308 respondents. This breakdown indicates a slightly lower participation rate among females compared to their representation in the sample. Overall, the study achieved a balanced gender distribution reflective of the initial population proportions.

Table 02. Demographic Analysis (n= 308)

	Frequency	Percentage
Gender		
Male	49	15.6%
Female	259	84.4%
Age		
20-30	296	96.1%
31-35	12	3.9%
Education Discipline		
BS Primary Education	35	11.4%
BS Elementary Education	113	36.7%
BS Secondary Education	160	51.9%

Educational Background

Arts	230	74.7%
Science	78	25.3%

The demographic analysis of the study's sample (n = 308) reveals that the majority of respondents were female (84.4%, n = 260), with males making up 15.6% (n = 48) of the sample. Most participants were aged between 20-30 years (96.1%, n = 296), with a smaller group aged 31-35 years (3.9%, n = 12). Regarding education discipline, the sample was composed of individuals studying BS Primary Education (11.4%, n = 35), BS Elementary Education (36.7%, n = 113), and BS Secondary Education (51.9%, n = 160), indicating a greater representation in Secondary Education. Additionally, the educational background of respondents showed a predominance of those with Arts/Humanities/FA (74.7%, n = 230) compared to Science/Natural Science/FSC (25.3%, n = 78). This demographic profile provides a detailed overview of the sample's composition in terms of gender, age, education discipline, and background.

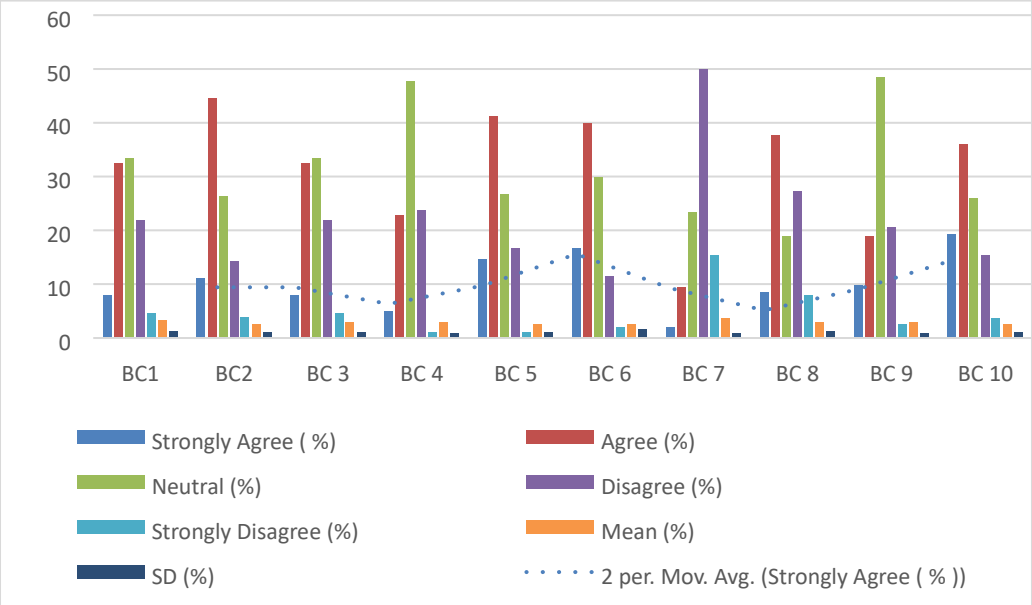
Results and Findings

"To investigate the Behavioural attitude of prospective teachers about climate change at higher level of education".

Table 03. Items Analysis of behaviour change attitude towards climate change (n=308)

Items	SA	A	N	DA	SD	Mean	SD
Climate Change (CC) is reversible.	7.8	32.5	33.4	21.8	4.5	3.18	1.166
Learning environmentally friendly ecological system.	11.0	44.5	26.3	14.3	3.9	2.56	.995
CC is a natural phenomenon.	7.8	32.5	33.4	21.8	4.5	2.83	1.005
CC is due to human behaviours.	4.9	22.7	47.7	23.7	1.0	2.93	.834
Education for sustainable development is essential.	14.6	41.2	26.6	16.6	1.0	2.48	.967
Inclusion of CC education.	16.6	39.9	29.9	11.4	1.9	2.56	1.556
Teaching about CC.	1.9	9.4	23.4	50.0	15.3	3.67	.913
Global warming is controllable.	8.4	37.7	18.8	27.3	7.8	2.88	1.135

Reducing carbon footprint.	9.7	18.8	48.4	20.5	2.6	2.87	.934
Institutional capacity for climate action.	19.2	36.0	26.0	15.3	3.6	2.48	1.075

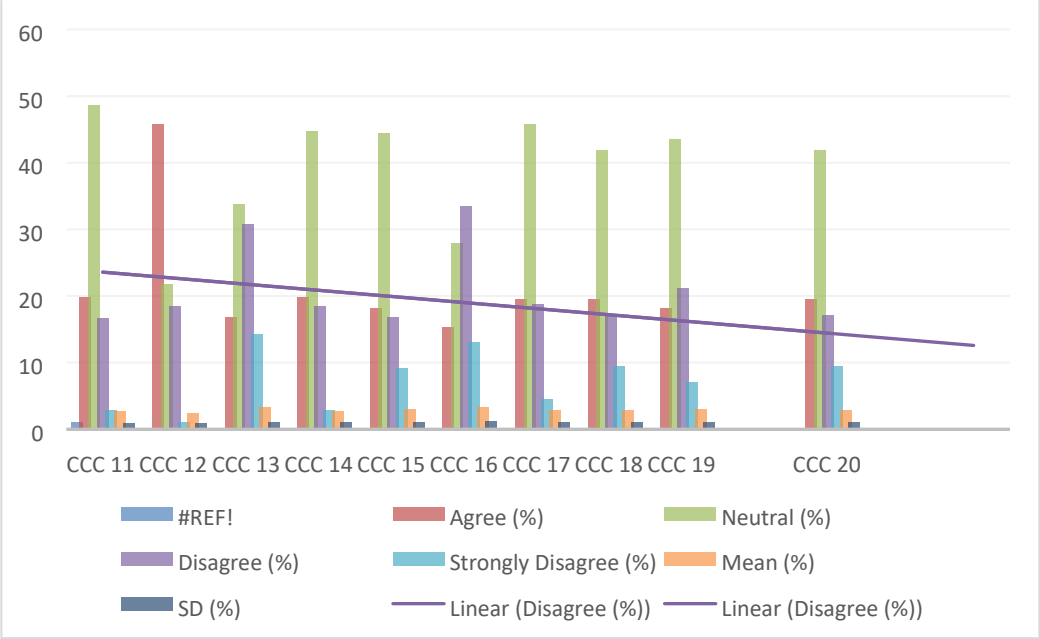


The above table and graph shows the statistics of prospective teachers' attitudes towards climate change based on their climate-related behavioural attitude about climate change. The mean of the first variable for behavioural attitude among prospective teachers was 3.18, and the standard deviation (SD) was estimated to be 1.166 regarding the belief that climate change is a reversible phenomenon. A total of 40% of prospective teachers agreed, and 34.4% remained neutral. In terms of learning about climate change and moving towards a more environmentally friendly future, 55.5% of prospective teachers expressed a willingness, with a mean score of 2.56 (SD, 0.99). The majority of aspiring teachers (40.3%) think that climate change is a natural occurrence, as indicated by the average score of 2.83 (SD = 1.005) on the third item. Conversely, the average score of 2.93 (SD = 8.34) on the fourth item showed that aspiring teachers did not accept that human activity is the cause of climate change, with 47.7% stating they did not understand. The mean scores of aspiring teachers on the fifth and sixth items were 2.48 (SD = 0.967) and 2.56 (SD = 1.556), respectively. 55.8% and 56.5% strongly agreed on the significance of incorporating climate change education in future teacher curriculum. The mean of the 7th item was 3.67 (SD =.913) regarding prospective teachers' capacity to teach climate change education, and the majority (65.3%) responded with the lowest ability to teach climate change. The eighth-item mean was 2.88 (SD =1.135), showing most teachers believed collective efforts could reverse global warming, as evidenced by the 46.1% of prospective teachers who agreed to collaborate. The mean of the 9th item was 2.87 (SD =.934), indicating that few prospective teachers agree on the need to take decisive action to minimise carbon footprints, with 48.4% responding neutrally. The mean score of the tenth item was 2.48 (SD = 1.075), and nearly 55.2% were up to date about how knowledge can enhance institutions' abilities to mitigate and adapt.

"To investigate the campaign attitude of prospective teachers about climate change at higher level of education".

Table No:04 Items Analysis of climate change campaign attitude about climate change (n=308)

Items	SA	A	N	D	SD	Mean	SD
Billion Tree Tsunami Campaign and SDG 13.	12.0	19.8	48.7	16.6	2.9	2.79	.958
Fundamental steps towards the climate action.	13.0	45.8	21.8	18.5	1.0	2.49	.970
Clean and green Pakistan campaign.	4.2	16.9	33.8	30.8	14.3	3.34	1.051
Promoting bio dermal material for climate action.	14.0	19.8	44.8	18.5	2.9	2.77	1.004
Clean and green Pakistan campaign can engage the locals.	11.4	18.2	44.5	16.9	9.1	2.94	1.081
Moral Obligation to respond to climate change.	10.4	15.3	27.9	33.4	13.0	3.23	1.171
Increase the cleanliness of environment.	11.4	19.5	45.8	18.8	4.5	2.86	1.001
Human activities are major contributor to global warming.	12.0	19.5	41.9	17.2	9.4	2.93	1.106
Prevent the worst effects of global warming.	10.1	18.2	43.5	21.1	7.1	2.97	1.041
Global warming can be reversible.	12.0	19.5	41.9	17.2	9.4	2.83	1.100



The above table and graph shows the attitudes of prospective teachers towards campaigns about climate change. The mean of the 11th item was 2.79 (SD = 958), indicating that almost half of the respondents (48.5%) do not know the importance of the billion-tree tsunami in achieving SDG 13. The mean of item No. 12 was 2.49 (SD = 0.970), and most prospective teachers (55%) expressed their willingness to educate children about climate change. The mean of the thirteenth item was 3.34 (SD = 1.051), as according to data results, 45.1% of prospective teachers neither agreed nor had much knowledge about the "Clean Green Pakistan" campaign. The mean score for the 14th item was 2.77 (SD = 1.004), as 44.8% of respondents were neutral and prospective teachers were not willing to make direct efforts to promote bio thermal materials as part of a climate change campaign. The mean of item No. 15, which was 2.94 (SD = 1.081), indicated that almost most respondents, 44.5%, had an unfavourable opinion on the government's "Clean and Green Pakistan" campaign's ability to motivate people to create a pollution-free environment. The mean score for item No. 16 was 3.23 (SD = 1.171), representing that most respondents (46.4%) did not believe they had an ethical obligation to address climate change. The mean score for the 17th item was 2.86 (SD = 1.001) because the majority, 45.8%, responded with indifference to the statement about seeking to adopt all practises that enhance environmental cleanliness. The mean of the 18th item was 2.93 (SD = 1.106), while 42.9% of respondents believed that human actions were the primary cause of global warming. The mean score and standard deviation of the 19th item were 2.97 and 1.041, respectively, as 43.5% of prospective teachers responded impersonally to the statement that humans were unable to mitigate the worst impacts of global warming. The mean score for the twentieth statement was 2.83 (SD = 1.100), as almost 41.9% of prospective teachers felt impartially that people could help minimise global warming.

Table No:05. Gender comparison of attitude towards climate change (n=308)

Variable	**Sector**	**N**	**Mean**	**SD**	***df***	**t -value**	**Sig**
Attitude	Male	48	2.93	.385	306	.898	.372
	Female	260	2.87	.444			

The result is significant at p < .05.

From Table 9, the P-values (0.005) indicate that the computed t-value (t = -0.898) for the mean difference between male and female has a positive effect, but it is not statistically significant (sig = 0.372). Thus, a significant difference was not found in attitudes towards climate change between males (2.93) and females (2.87). Therefore, the null hypothesis Ho1: There is no difference in prospective teachers' attitudes towards climate change based on gender is not rejected.

"There is no difference in the Behavioral attitude of prospective teachers about climate change based on gender".

Table No: 06. Gender comparison of behavioural attitude about climate change (n=308)

Variable	Gender	N	Mean	SD	*df*	t -value	Sig
Behavioural Attitude	Male	48	3.01	.323	306	3.403	.001
	Female	260	2.82	.515			

The result is not significant at p < .05

The computed t-value (3.403), as indicated in above table, is significant at the 0.05 level of significance (sig =.001). Males (3.01) and girls (2.82) who wanted to be teachers had significantly different behavioral views toward climate change. This led to the rejection of the study's hypothesis (H01a), which stated that there is no gender-based difference in the behavioral attitudes of aspiring teachers about climate change.

Table No: 07. Gender comparison of attitude about climate change Campaign (n=308)

Variable	Gender	N	Mean	SD	*df*	t -value	Sig
CC Campaign	Male	48	3.05	.498	306	1.681	.097
	Female	260	2.92	.520			

Above table demonstrates that at the 0.05 level, the t-value (1.681) is not statistically significant (sig =.097). Regarding the climate change campaign, there were no statistically significant variations in the perspectives of male and female prospective teachers (3.05 and 2.92, respectively). **Discussion**

The majority of the prospective instructors in the survey, both male and female, did not appear to have a thorough understanding of climate change. They did, however, know what "climate change" meant and were aware of its existence. The findings supported earlier research that demonstrated primary school teachers' ignorance of climate change and emphasized the necessity

of a national policy to properly address the problem (Ochieng & Koske, 2013). Alarmingly, the findings apply to a large number of people who believe that human activity is not the cause of climate change. Most representatives, including teachers, still had a low level of concern for the future of our children, as supported by the previous study conducted by Gustria and Fauzi (2019), which found that those children had a negative attitude towards the shifting weather conditions. Hence, the instructor must update the course materials for the subject concerned to develop students' attitudes towards the environment. According to Feierabend (2011) mostly prospective teachers displayed minimal interest in teaching about climate change in classrooms due to their limited understanding of climate change and environmental changes. But when it comes to teaching and learning, they have an average attitude. They were eager to learn but lacked the same enthusiasm when it came to teaching their students. Berger et al. (2015) also discovered in their research that most participants had limited knowledge of climate change but expressed a desire to acquire the necessary qualifications to teach about it in the future. Identical results have been analysed. Pre-service teacher training should assess the necessary training for students to become competent in taking action to mitigate climate change. Seeing as knowledge of the environment and a responsible attitude toward the environment were important factors in enhancing environmental sustainability, the study by Dal et al. (2015) was in line with current research findings. Uncertainty indicators included distrust in information sources, inconsistency, and media coverage. This study revealed the findings of a lack of interest in attitudes towards climate change mitigation. Also, the outcomes of this study indicate that pre-service teachers were often willing to pursue low-impact preventive measures, but they were hesitant to use high impact preventive measures. This was consistent with the findings of a recent qualitative study in Finland, which revealed that most educators there stated that they only engage in low-impact activities (Hermans, 2016). Our research suggests that preservice teachers were unprepared to teach or answer questions about climate change. **Conclusion and Recommendation**

Teacher education curricula should integrate and promote an active approach, encouraging instructors to discuss topics such as Climate change for Sustainable. It is evident as most of the respondents did not have a knowledge-oriented mind-set to demonstrate a positive attitude towards climate change. Conclusively, both male and female prospective teachers exhibited low to medium level of attitude towards climate change. Most of the prospective teachers responded that they did not get a chance to participate in any campaign related to climate change. According to the results and conclusions, attitudes towards climate change were found to be limited. Therefore, it is recommended that universities prioritise climate change action training to enhance prospective teachers' understanding and competence.

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Appendix

This section asks you about your attitude towards Climate Change and Attitude Assessment Scale.

4. Attitude towards climate change Attitude is defined as a prospective teacher's belief and how they tend to build behaviour and campaign for mitigating and adaptation towards climate change.							
4(a). Behavioural changes lead to climate change							
1	BC1	I believe that the impacts of climate change are reversible.	SA	A	N	D	SD
2	BC2	I would like to learn about environmentally friendly ecological system.					
3	BC3	I believe that climate change is a natural phenomenon.					
4	BC4	I accept that climate change is associated with human behaviours.					
5	BC5	Education for sustainable development is very important to educate the young generation.					
6	BC6	I feel climate change education should be included in the teacher education curriculum.					
7	BC7	I, as a teacher can educate about climate change.					
8	BC8	I believe global warming can be controlled with the collective efforts and actions taken by the human beings.					
9	BC9	The most impactful act to reduce carbon footprint is the eggplant-based diet.					
10	BC10	I believe that awareness about climate change can grow the institutional capacity for climate change mitigation and adaptation.					
4(b). Lead climate change campaign							
11	CCC1	The Billion Tree Tsunami Campaign is critical for achieving sustainable development goal 13 (SDG 13).	SA	A	N	D	SD
12	CCC2	Education about climate change can be a fundamental step towards the climate action.					
13	CCC3	I have enough information about the clean green Pakistan campaign.					

14	CCC4	I am ready to make specific efforts of promoting bio dermal material for climate action strategy.					
15	CCC5	Government clean and green Pakistan campaign will engage the locals to achieve the pollution-free environment.					
16	CCC6	I feel a moral obligation to respond to climate change.					
17	CCC7	I and most of my friends are trying to adapt all habits that increase the cleanliness of environment.					
18	CCC8	In my opinion, human activities are major contributor to global warming.					
19	CCC9	I agree that human beings are helpless to prevent the worst effects of global warming					
20	CCC10	I believe that humans can reduce global warming, if they are responsible for it.					