



Climate Change Risk Perception and Youth Mainstreaming: Challenges and Policy Recommendations

Shazia Hassan¹ · Wajeeha Ghias¹ · Tatheer Fatima²

Received: 9 April 2018 / Accepted: 15 June 2018 / Published online: 6 July 2018
© Springer International Publishing AG, part of Springer Nature 2018

Abstract

This study demonstrates the risk perception of Pakistan's youth about climate change. Statistics have provided the significant median age of Pakistan as 23.8 where 60% of the population lies. The objective of the study is to assess the youth awareness level with climate change and transform their attitude for better policy formation. Currently, the 40% population of Pakistan is subjected to natural disasters because of climate change, which is a concerning barrier to economic growth. Previous studies lack in context of measuring climate change risk perception. Current study fills the gap by analyzing these issues in the context of Pakistan's youth. Data collected in quantitative form, from a primary source. The unit of analysis is the youth of Pakistan. Data analysis is based on frequency distribution and Chi-square test results. The provided results have shown significance between the age, gender, educational level, and educational institute with the climate change knowledge. Based on the identified gaps and loopholes in the awareness level, potential recommendations are being drawn along with strong practical implication of policy formation.

Keywords Climate change · Perception · Youth mainstreaming · Pakistan

1 Introduction

The main driving force for any nation is youth. Their attitudes, perspectives, and choices of lifestyle shape the future of their nations. They do not only contribute towards the economic development of a country, but play a significant role in the consumption of resources, triggering multiple externalities. Where a country's population consists of young members in the majority, between the ages of 15–24, the mix of suitable policies and public goods required by them, will vary significantly from nations with a mature or aged population dynamics (Deutsch and Theodorou 2009). Hence, at the time of planning and identifying the needs of a population, a government

needs to peculiarly look into the factors surrounding its public and respond accordingly, to address the country's critical matters. Identification of challenges faced by the nation is only the first step for the government (Burstein 2003). The real task is bridging the understanding gap and expectation gap between all stakeholders. Bringing on board the public is the real task to make the whole process useful and achieving the long-term goal. Agencies and companies spend exorbitant funds for the placement of their products to maximize sales and profitability. Accordingly, on the development front, from a country's perspective, it only makes sense, why governments also spend enormously to assess and determine the needs of its public (Burstein 2003). Of course, the answer to that lies in their objective to ensure effective policymaking and provide the necessary public goods and services. To achieve the above, the government needs to build effective know-how of the public and the challenges faced by them.

The dynamics involved in the making of national policy and provisioning of public goods and services, however, has changed drastically over the period. Decisions and policies, once primarily governed by local factors, now lies exposed to global influence, as well. Increased globalization, regional cooperation, cross-border trade agreements and economic treaties, today, has amplified challenges, of less significance

✉ Shazia Hassan
shaziahassan@ndu.edu.pk; shaziahassan786@hotmail.com

Wajeeha Ghias
wajeeha@ndu.edu.pk; wajeeha_ghias@live.com

Tatheer Fatima
tatheer.fatima@live.com

¹ Leadership and Management Studies (LMS) Department,
Faculty of Contemporary Studies, National Defence
University, E-9, Islamabad, Pakistan

² SAZABIST, Islamabad, Pakistan

earlier. One of the most impactful challenges, till date, of the twenty-first century, is climate change. The acknowledgment of its existence is a reality check for nations, transforming the course of their actions, while forcing some to reinvent the wheel of their economic activity, primarily.

In today's era of surplus information, with easy access, about what's happening all around the world, latest breakthrough in science and technology, statistics, etc. it is hard to imagine a person, denying a reality such as climate change and its impact (Leombruni 2015). The underlying factors, although debatable; the increased natural disasters, dramatic changes in weather patterns, have made nations vulnerable to economic and human loss. The weaker an economy is economically and the more populous it is, means increased risks of loss. Hence, the need and urgency to address the underlying issues of climate change more fervently.

Pakistan, one of the emerging economies of today, occupies a prime position in the world, regarding its resources and strategic positioning on the world map. Despite, being a relatively slow-paced developing country regarding economic activity and progression, Pakistan is one of the eight countries expected to be mostly populated by 2050 as per the World Population Data Sheet 2017 (Prb.org 2017). The vulnerability of the Pakistani public to the adverse effects of climate change, hence, is dependent on the level of its preparedness.

Accordingly, to measure and assess the level of preparedness of Pakistan for climate change, evidence needs to be gathered and evaluated. Study of techniques, being used in the past and currently, to evaluate the efforts put in by countries to combat this issue suggests many ways. Building plans and establishing sustainable policies, on the opinion of those exposed to the risks of climate change, is considered as one of the most effective ways to execute a plan or bring in a change effectively. Based on this, Pakistan with its population median age of 23.8 years as per the Central Intelligence World Fact Book Agency (CIA.gov 2018), makes the Youth, the most vulnerable segment of its population. Hence, analyzing the risk perception and stance on climate change of this most vulnerable segment is critical. Just as important is it is for a company to know their customer, their preferences, liking, and reactions, to sell their product and modify it as necessary. Similarly, to determine the needs of the public and the most effective way to bring a change in human activities triggering. Climate change is to know their views and understand their thinking. Lee (2016) explains that often there is variation in the intensity of expression of public concern and how eager one is to address the issue.

1.1 Literature Review

Worldwide climate change has become one of the most concerning issues. It has witnessed in the form of series of intensified and frequent disastrous climatic events. The climate change impacts have been reflected over numbers

of sectors including forestry, water, human health, and agriculture. However, the vulnerability to climate change cannot be marked in case of Pakistan due to lack of comprehensive analysis done on Pakistan's climate neither at national nor at international level. Despite, some indices have ranked Pakistan among the top vulnerable country to climate change. It was studied by Maplecroft's (2011) where he ranked Pakistan on 16th most affected country, while Harmeling (2011) ranked Pakistan on 8th level as per Global Climate Risk Index. The lack of evidence and policy formation at the end of Pakistan has caused severe effects. There is lack of effective policy formation and implementation being witnessed.

Barimah et al. (2015) in their study on understanding the perspective of youth in preparing for climate change explores how knowledge of people belonging to a particular area, about climate change influenced their actions. Based on the extent of their understanding of the matter and necessary know-how of the subject, evidenced to what extent the issue of climate change was of importance to them. The study indicated that although there lies remarkable degree of variance amongst the understanding of the subject, irrespective of this fact, people belonging to every category of job, had witnessed the impact of climate change. In addition to this, despite gaps in their understanding, everyone was on his or her own still adapting to the changes and making an effort to combat the crises of climate change through the adoption of various primitive measures.

Hansen et al. (2012) based their study on 'climate biases'. They assessed whether changes in weather and extended periods of particular weather were in line with historical trends linking it to the impact of global warming. In their study, they examined the changing pattern in weather, through Seasonal, Regional and Temperature variability and anomalies analysis. Based on statistical tests performed on data gathered over an extended period, they attempted to identify the indicators and effects of climate change evidenced by global warming. An extended period of hot weather was experienced as compared to shorter periods of winter experienced in the area of Ghana due to global warming. They also identified based on the input received from respondents, how few of them misinterpreted the changes taking place around them in weather due to lack of knowledge about the subject. This effect of this misinterpretation on a larger scale, if extrapolated could give an estimate of how public action or outcome can sometimes be based on incorrect reasoning or perception.

Further, similar to Pakistan, India also stands exposed to severe climate changes based on it being an agricultural country. Zaheer and Colom (2013) attempted to study the perception of people in Pakistan about climate change, in addition to how they fundamentally plan to tackle this issue. The crux of this study not only lied at understanding how people of Pakistan were responding to this issue, but also

how other stakeholders were expected to play their part. Using liaising and establishing channels of various communications between different stakeholders comprising of the Government, media and other, the issue of climate change should be addressed. The study highlighted the barriers to tackling this problem in the opinion of people. Along with this it also attempted to determine the essential point of views carried amongst the public regarding the significance of the matter. The findings of the study also touched upon how climate change will affect the resources in Pakistan regarding livelihoods, water, energy, health, food and last, but not the least weather.

Van der Linden (2017) in the study discusses the various factors surrounding risk perceptions about issues including climate change. It explains how there are factors other than just the perception of a matter which adds up to the overall risk surrounding the matter, urging one to react or deal with the matter, accordingly. This includes physiological factors, the impact of surroundings, socio-cultural and demographic characteristics, etc. In addition to this, the study argues that the means or standard of measuring risk perception also significantly impacts the outcome or reasoning derived from the tests, ultimately affecting policy.

Specific to climate change, the study also states that public concern about climate change and the eagerness of stakeholders to attend to the matter contributes significantly towards successfully dealing with this issue. Singh and Singh (2011), in their research conducted in India, aimed to assess and evaluate the perception of climate change and how it impacted their day to day choices and ultimately their attitude. Although the issue of climate change is a global issue, India being a key country regarding size and economic impact had long ago started experiencing the impact Global Warming on its economic activity regarding pollution and water scarcity. Accordingly, to mitigate the impact of climate change and its disastrous effects, taking initiatives pro-actively is the only choice.

This means being prepared by taking into account the opinion and point of view of the most significant component of its population, i.e., the youth. In an economy comprised of a considerable number of similar aged and profiled individuals, assessment of their point of view and attitude towards this matter is critical to mitigate the impact of climate change. The researchers (Adger et al. 2009) also acknowledge and highlight, that since the youth represent a significant chunk of the public, it only makes sense that they stand to lose the most or are most vulnerable in the case on any natural disaster hitting the country.

Empowering youth to deal responsibly with climate change issues should be necessary for education (Schreiner et al. 2005). Druckman (2015) emphasized that policy instruments can play a significant role in addressing the threats posed by climate change. Policy instruments include multiple instruments based on social and

market perspectives, effective public policy and sustainability diagnostics as a means for Government Intervention. Edenhofer et al. (2014) in Inter-Governmental Panel for Climate Change's Fifth Assessment Report discusses challenges for dealing with climate change along with the targets agreed to be achieved through improving process and activities in various areas including emission targets and technological changes.

A phenomenal emphasize anticipated by Poortinga et al. (2011) that positive impact of youth awareness of climate change as younger people has less climate skepticism than older people who can be useful in building environment-friendly society. Druckman (2015) emphasized that policy instruments can play a significant role in addressing the threats posed by climate change. Policy instruments include multiple instruments based on social and market perspectives, effective public policy and sustainability diagnostics as a means for Government Intervention. According to Boyes et al. (2009) students were showing much willingness to do measure for climate protection. There is recognized the need to adapt to changing climate conditions which is an emerging discourse (Adger et al. 2009). Additional apprehension identified by Lo (2016) that citizens of advanced industrial countries contribute more to environmental protection than lower income countries and Pakistan is one of lower income countries.

Young people also face a hurdle to get their voices heard and research on climate change present youth as passive victims (Haynes and Tanner 2015). The issue of values, risk knowledge, and cultural construct are societal limits to adaptation, but these are mutable (Adger et al. 2009). We should highlight benefits of engagement of society in local climate change initiatives (Kaeschage et al. 2014). Climate change and risk perception depend upon person risk judgment (Van der Linden 2015). A population attitude towards climate change can strongly influence government policies as well as individual behavior (Leombruni 2015). The personal level of engagement in climate change measure largely depends upon personal perceptions (Myers et al. 2013). In this way, youth perception about climate change plays a pivotal role to develop their engagement in climate mitigation and adaptation.

1.2 Research objectives

Based on a literature review on youth's perception of climate change and risks associated with; present study is formulated for essential yet straightforward objectives to understand youth perception about climate change. How they related themselves to their environment? Do they feel any responsibly about climate change?

Furthermore, the current study focuses on determining if is there a significant relationship between age, gender,

educational level, and educational institutions type concerning climate change knowledge. In this regard below hypotheses are formulated.

1.3 Research Hypothesis

- H_{a1} There is a significant difference of climate change knowledge among female and male students.
- H_{a2} There is a significant difference of climate change knowledge among the different age group of students.
- H_{a3} There is a significant difference of climate change knowledge between different educational level.
- H_{a4} There is a significant difference of climate change knowledge among public and private educational institutions' students.

2 Methods

For the study, researchers adopted questions items deem relevant to the cultural context of Pakistan from already developed questionnaires available online (Ojomo et al. 2015). The instrument consists of three parts. The first part used to measure demographic information of respondents covering an aspect of gender, educational level, age, etc. The second part consists of forced-choice items related to climate change. The forced-choice enables respondents to rank objects relative to one another, among the alternative provided. Some of the items of part 2 are:

- What does climate change mean to you? Tick all that apply.
- Who do you think is most vulnerable to the effects of climate change?
- What do you think are the effects of climate change? Tick all that apply.
- What region of Pakistan do you think is more vulnerable to the effects of climate change?

The third part tap responses on 5-point itemized rating scale where 1 = agree strongly and 5 = disagree strongly. The third part consists of 37 items. A sample of the questions included in third part is:

- People should be made to reduce their energy consumption if it reduces climate change.
- Climate change is just a natural fluctuation in earth's temperatures.
- The government should provide incentives for people to look after the environment.
- I am uncertain about whether climate change is happening.

The unit of analysis for present research is 'student' studying at Islamabad region only. It includes students from schools, colleges, and universities. Convenient sampling technique was adopted for data collection, and total 180 questionnaires were distributed out of which final 112 questionnaires were found complete for data analysis. It represents 62% response rate.

The data were analyzed with SPSS. The study findings were presented through descriptive statistics where appropriate charts were also used. For hypotheses testing; Chi-square test is applied.

3 Results and Discussion

Table 1 presents the demographic information of respondent. 55% respondents were male, and 45% were females. Concerning age, 49% respondents were 17–20 years of age group with the similar percent of college students. 71% respondents were from urban areas. Furthermore, 49% respondents were enrolled in the Intermediate/A-level program.

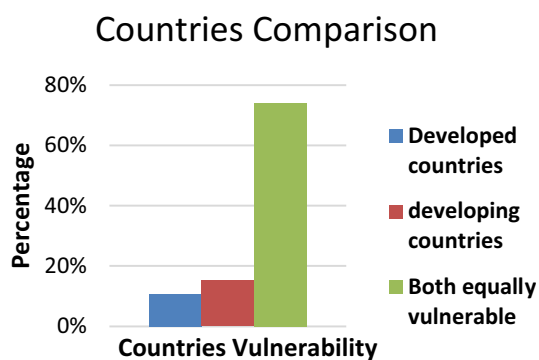
On inquiring about the climate change in term of the source of awareness and involvement of the institute in building campaigns, following responses were acquired (Table 2).

Table 1 Demographic variables ($n = 112$)

Description of variables	Frequency	Percent
Gender		
Male	62	55
Female	50	45
Age		
14–16	22	20
17–20	55	49
21–23	25	22
24 and above	10	9
Educational status		
School	40	36
College	55	49
Universities	17	15
Educational institution type		
National	45	40
Private	67	60
Area students belong to		
Rural	33	29
Urban	79	71
Degree program students enrolled in		
Matriculation/O-level	13	12
Intermediate/A-level	55	49
BS	34	30
MS/M.Phil.	10	9

Table 2 Respondents awareness about climate change

Items	Responses	Percentage
In what level of the educational institution were you taught about climate change?	School level	13
	College level	21
	University level	29
	Both and school and university	38
Climate change campaigns carried out by the educational institute?	Yes	35
	No	65
Main sources of climate change information?	Internet	29
	Educational institute	35
	Government agencies	4
	NGOs	9
	No source of climate change information	22

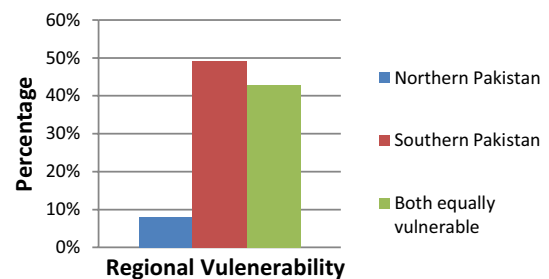
**Fig. 1** Countries vulnerable to the effects of climate change?

About climate change at an educational institution, findings reveal that school curriculum missed the climate change as only 12% respondents. Whereas, climate change is getting focus both at university and college level (38%). However, there is still much to do. On the other side, collected responses indicated that only 35% climate change campaigns were carried out at their educational level while 65% reported no such activity.

Furthermore, the primary source of climate change information for youth after educational institution (36%) is internet (30%). On the other hand, almost one-fourth do not have any source of information regarding climate change. This indicates an area for policymakers to look over.

Figures 1 and 2, respectively, tapped the respondent perception of vulnerability about global as well as country level. 71% youth think that both developed, as well as developing countries, are vulnerable to the effects of climate change, whereas findings show that youth perceived that southern region of Pakistan is more vulnerable with 49%.

On inquiring about climate change from individual based on their perception, following responses were collected.

Pakistan's Regional Vulnerability**Fig. 2** Region of Pakistan vulnerable to the effects of climate change?**Table 3** Individual's perception of climate change

Items	Responses	Percentage
What does climate change mean to you?	Change in temperature	12
	Change in environment	6
	Change in weather condition	50
	Change in climate due to human pollution	10
	Change in climate due to global warming	13
	I do not know	9
What do you think are the effects of climate change?	Sea level rise	12
	Drought	6
	Global warming	60
	Rising temperatures	11
	Increasing intensity and frequency of extreme weather events	9
	None	3

In the study, one of the questions was asked to tap youth's perception of what does climate change mean to them. As presented in Table 3, almost 50% has identified climate change concerning the change in weather conditions,

whereas 13% viewed climate change as a change in climate due to global warming. Further, the results indicated that 12% viewed change in temperature is climate change. Furthermore, on inquiring about the effects of climate change revealed that 60% youth believe that global warming is due to changing the climate. Interestingly, 12% identified an increase in sea level is also due to climate change. More so 11% youth believe that rising temperature is because of climate change.

In Fig. 3, In response to the question “of the nine environmental issues listed below, please choose three you believe should be the top priorities of the country” 36% youth perceived that overpopulation as should be a top priority. After that, they have identified population (23%) as an environmental issue which country should tackle with. Lastly, 20% youth believes that climate change should be the third agenda points regarding country response to environmental issues.

Regarding preparedness for the effect of climate change, as indicated in Fig. 4, 49% youth will contribute through

promoting climate change awareness campaigns. At the same time, 29% suggested for advocating for climate change adoption, integration into academics. Additionally, 10% youth personally interested in educating themselves more about climate change and its effects.

3.1 Chi-Square Results

Table 4 present the results of Chi-square for all four hypotheses. Concerning age and climate change knowledge, the Pearson Chi-square value is 123.847 with 0.602 Cramer's V value. Regarding gender and climate change knowledge, the Pearson's Chi-square value is 81.405 with 0.853 Cramer's V value. Concerning educational level (school, college, and university) and climate change knowledge, the Pearson Chi-square value is 103.999 with 0.681 Cramer's V value. About educational institution type (national or private) and climate change knowledge, the Pearson Chi-square value is 107.657 with 0.980 Cramer's V value. The p value (0.000) for all four hypotheses are significant at the two-tailed test. The p value

Fig. 3 Of the nine environmental issues listed below, choose three priorities of the country

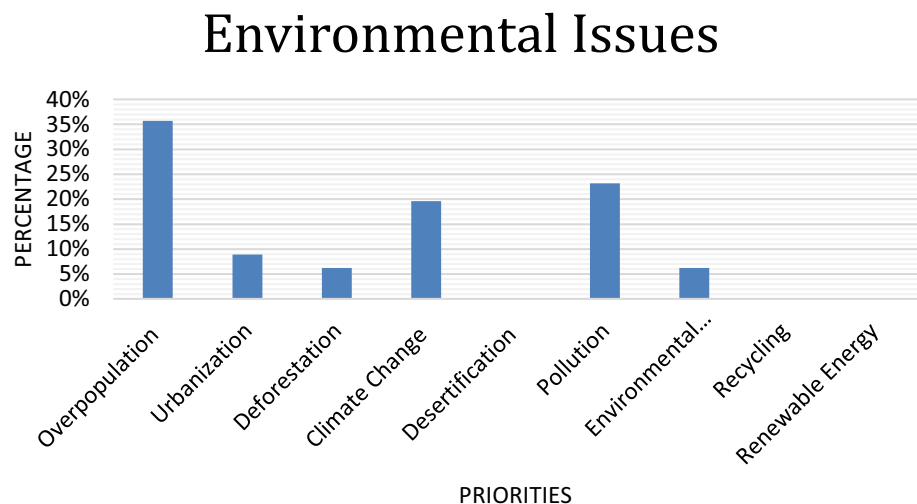


Fig. 4 What changes would you be willing to make to increase your preparedness for the effects of climate change?

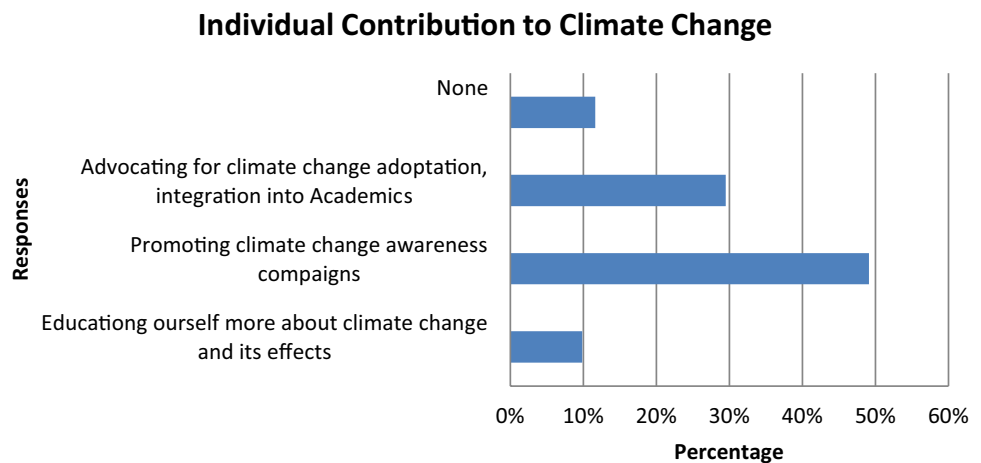


Table 4 Chi-square findings

Variable	Climate change knowledge ($n = 112$)				
	Pearson Chi-square	Symmetric measures		df	p value
		Phi value	Cramer's V		
Age	123.847	1.052	0.602	42	0.000
Gender	81.405	0.853	0.853	14	0.000
Edu. level	103.999	0.964	0.681	28	0.000
Edu. inst. type	107.657	0.980	0.980	14	0.000

indicates that these variables are not independent of each other and that there is a statistically significant relationship between the categorical variables.

4 Conclusion and Future Implications

Even though present study scope and size is insufficient, Nevertheless, it is first a drop in the ocean or contribution to understanding youth perception about their environment more specifically climate change. Furthermore, the present study, unconsciously directed youth to look at their surroundings and environment where they belong to.

On the other hand, several conclusions can be drawn from the findings of this research. First, the youth perception on climate change was based upon weather conditions; change in temperature and due to global warming, whereas significant reasons of climate change are the environment and human population. Poortinga et al. (2011) reviewed similar findings where less climate skepticism was witnessed at the end of youth. Second, upon the effect of climate change, mostly perception was based on global warming while other factors were ignored. These findings were found aligned with the study of Barimah et al. (2015). In literature, Leombruni (2015) was witnessed the role of the public in changing government's attitude toward climate change. However, in the current case, there is lack of adequate awareness at the end of people. Third, the youth considers that developed and developing countries both equally vulnerable to the effects of climate change.

Fourth, the perception about regions in Pakistan is more inclined towards southern Pakistan, whereas northern areas of Pakistan are equally affected. Fifth, the view about preparedness for the effect of climate change, mostly youth preferred that they should be given education on climate change and its effects moreover climate change adaptation should be integrated into university projects. They are willing to contribute through climate awareness campaigns. Sixth, the youth perceived that government role in climate change awareness is missing or not articulated at their level. However, Lo (2016) revealed the climate change policy formation

to be associated with the income level of the country where Pakistan being low-income country considered contributing less to environmental protection. The source through which they have information about the effect of climate change is the internet. Seventh, the youth perceives that top three environmental issues are overpopulation, pollution, and climate change. Although these environmental issues are of prime importance to the top, it is environmental education. Lastly, few university and colleges have included environmental science in their curriculum. These findings have aligned with a previous study of Zaheer and Colom (2013) conducted in the context of Pakistan.

Youth plays a critical role in the development of any society. This research paper has analyzed the youth perception about climate change risk perception and based on research findings following recommendations are suggested as Leombruni (2015) rightly indicated that a population attitude towards climate change could strongly influence government policies as well as individual behavior.

- There is a need for large-scale intensive research to understand how people perceived risks associated with a change in climate and how they can handle it.
- Climate change awareness is pivotal for any society, especially for youth. Therefore, there is need to create awareness among youth, and as identified by youth a potential means would be social media.
- Non-governmental organizations (NGOs) as the third segment of the society are very positively contributing towards many social causes, and climate change is an area where their due impact is yet to realize. Therefore, NGOs should play their part in awareness creation campaigns and preparedness for climate change risks.
- Academia, i.e., universities, colleges, and schools should take initiatives for conducting seminars and workshops on climate change risk perception.
- Academia should integrate courses related to the environment as a compulsory or core subjects for students at all levels, i.e., school, college, and university. More so there should be necessary to advanced level courses on the subject matter.
- The government should take the initiative to develop a linkage between academia and policymakers on the environment so that proper awareness and adaptation campaign can be launched.
- Last but not the least, developing youth to become self-aware and self-responsible for their self, environment, and society is a need of time.

Acknowledgements The researchers are thankful to Islamic Relief Pakistan, a non-profit organization in Pakistan for their support in conceptualization and successful completion of this research.

References

- Adger WN, Dessai S, Goulden M, Hulme M, Lorenzoni I, Nelson DR et al (2009) Are there social limits to adaptation to climate change? *Clim Change* 93(3):335–354
- Barimah PT, Kwadwo SO, David O (2015) Assessment of people's knowledge and perception on climate change: a case study of Asunafo North District, Ghana. *Int J Innov Res Sci Eng Technol* 4(1):18417–18424
- Boyes E, Skamp K, Stanisstreet M (2009) Australian secondary students' views about global warming: beliefs about actions, and willingness to act. *Res Sci Educ* 39(5):661–680
- Burstein P (2003) The impact of public opinion on public policy: a review and an agenda. *SAGE J* 56(1):29–40
- CIA.gov (2018) The world factbook. "Central Intelligence Agency". <https://www.cia.gov/library/publications/the-world-factbook/geos/pk.html>. Last date accessed 1 June 2018
- Deutsch N, Theodorou E (2009) Aspiring, consuming, becoming: youth identity in a culture of consumption. *SAGE J* 42(2):229–254
- Druckman JN (2015) Eliminating the local warming effect. *Nat Clim Change* 5(3):176–177
- Edenhofer O, Pichs-Madruga R, Sokona Y, Farahani E, Kadner S, Seyboth K, Kriemann B (2014) Climate change 2014: mitigation of climate change. In: Contribution of working group III to the fifth assessment report of the intergovernmental panel on climate change, Cambridge University Press
- Hansen J, Sato M, Ruedy R (2012) Perception of climate change. *Proc Natl Acad Sci* 109(37):E2415–E2423
- Harmeling S (2011) Global Climate Risk Index 2012: who suffers most from extreme weather events? Weather-related loss events in 2010 and 1991 to 2010. Germanwatch e.V, Bonn
- Haynes K, Tanner TM (2015) Empowering young people and strengthening resilience: youth-centred participatory video as a tool for climate change adaptation and disaster risk reduction. *Child Geog* 13(3):357–371. <https://doi.org/10.1080/14733285.2013.848599>
- Schreiner C, Henriksen EK, Hansen PJK (2005) Climate education: empowering today's youth to meet tomorrow's challenges. *Stud Sci Educ* 41(1):3–49
- Kaeshage K, Leyshon M, Caseldine C (2014) Communicating climate change—learning from business: challenging values, changing economic thinking, innovating the low carbon economy. *Fenn Int J Geogr* 192(2):81–99
- Lee FL (2016) Impact of social media on opinion polarization in varying times. *Commun Public* 1(1):56–71
- Leombruni LV (2015) How you talk about climate change matters: a communication network perspective on epistemic skepticism and belief strength. *Glob Environ Change* 35:148–161
- Linden V (2017) Sander, determinants and measurement of climate change risk perception, worry, and concern. In: Nisbet MC, Schafer M, Markowitz E, Ho S, O'Neill S, Thaker J (eds) *The oxford encyclopedia of climate change communication*. Oxford University Press, Oxford, UK. <https://doi.org/10.2139/ssrn.2953631>
- Lo AY (2016) National income and environmental concern: observations from 35 countries. *Public Underst Sci* 25(7):873–890
- Maplecroft (2011) Maplecroft's climate change risk Atlas. https://www.maplecroft.com/about/news/gra_2011.html. Accessed 04 June 2018
- Myers TA, Maibach EW, Roser-Renouf C, Akerlof K, Leiserowitz AA (2013) The relationship between personal experience and belief in the reality of global warming. *Nat Clim Change* 3(4):343
- Ojomo E, Elliot M, Amjad U, Bartram J (2015) Climate change preparedness: a knowledge and attitudes study in Southern Nigeria. *Environments* 2:435–448. <https://doi.org/10.3390/environments2040435>
- Poortinga W, Spence A, Whitmarsh L, Capstick S, Pidgeon NF (2011) Uncertain climate: an investigation into public skepticism about anthropogenic climate change. *Glob Environ Change* 21(3):1015–1024
- Prb.org (2017) 2017 World population data sheet with a special focus on youth. "PRB". https://assets.prb.org/pdf/17/2017_World_Population.pdf. Last date accessed 1 June 2018
- Singh AK, Singh SP (2011) Analysis of perception and attitude on climate change of Indian youth. *Indian J Dev Res Soc Act* 7(1–2):79–113
- Van der Linden S (2015) The social-psychological determinants of climate change risk perceptions: towards a comprehensive model. *J Environ Psychol* 41:112–124
- Zaheer K, Colom A (2013) Pakistan—how the people of India live with climate change and what communication can do. BBC Media Action, London



Dr. Shazia Hassan (PhD), Assistant Professor at National Defence University, Islamabad, has over 17 years of experience in development and academic sector. Her areas of interest are in industrial psychology, followership, Islamic leadership and management practices, Islamic finance and ethics, current affairs, CPEC, climate change and various organizational and social matters pertaining to individual, groups, organizations and societal sustainable development.



Ms. Wajeeha Ghias is lecturer at National Defence University, Islamabad, and has been teaching since last three years. She is Master Trainer of Faculty Professional Development Program certified from Higher Education Commission of Pakistan. Along with teaching, she has 20 years of volunteer experience in Pak Army Families Welfare organization. Her teaching areas of interest are environmental leadership, inclusive leadership, followership, industrial psychology, and community service.



Tatheer Fatima is a former student of SZABIST Islamabad, Pakistan, from where she completed her M.Sc. Development Studies in 2017. By profession, Tatheer is a chartered accountant from the Institute of Chartered Accountants of England and Wales, and is currently working as a Manager in Ernst & Young's Assurance practice in Pakistan since 2011. Her portfolio majorly comprises various low–high risk, development and non-profit sector clients. Before joining Ernst & Young, Tatheer

completed her first professional certification in accounting from Association of Chartered Certified Accountants (ACCA) in 2015 and B.Sc.

Hons in Applied Accounting from Oxford Brookes University, UK, in 2010. Since 2017, Tatheer has been building on her skills as a researcher along with capitalizing her rich practical experiences of working with various local, governmental and international organizations and donors. She aims to augment the understanding around various local and global sustainable development practices and contribute as a specialist towards the related public policy matters.