

# Understanding Climate Change Awareness of Undergraduates of University of Delhi

Anubha Das

Department of Zoology, Zakir Husain Delhi College (M), University of Delhi, New Delhi- 110002, India

**Abstract:** *Climate change has turned into a global urgency demanding immediate attention and action from all stakeholders. Universities have a significant role in disseminating knowledge on this critical issue and building up climate change awareness as youth constitute a major force that can tremendously impact our efforts to combat climate change. Not many research studies had been carried out to understand awareness level of undergraduates, especially in India. Therefore, it becomes imperative to understand the climate change awareness level of students as awareness and understanding of the issue leads to behavioral change and transform thoughts into action. This study was an attempt to assess the climate change awareness of undergraduate students enrolled in various colleges of Delhi university and understand the influential factors contributing to their awareness level. An online survey consisting of questionnaire adopting Likert -type scale was conducted using Google Forms. A total of 364 undergraduate volunteers spread across various colleges participated in the study constituting a random population sample. The result indicated that majority of students do perceive climate change and possess high awareness level, however a small fraction of participants is yet to consider climate change a reality. This finding is highly concerning and has valuable implications as for a collective and effective climate action, the factors responsible for this gap needs to be identified and filled.*

**Keywords:** climate change, climate change awareness, undergraduates

## 1. Introduction

The People's Climate Vote, a survey conducted by United Nations Development Programme (UNDP) to gather public opinion on climate change turned into world's largest survey with 1.2 million participants spread across 50 countries [1]. The survey was aimed to serve as bridge, connecting public and policymakers. With 64% of the respondents accepting it as a global emergency, the results aided in furnishing information on public's perception on climate change, to policymakers. Interestingly, over half a million respondents were under 18, constituting a significant proportion of stakeholders. Youth's climate change awareness is a key factor governing their actions and attitude towards climate change and being a repository of talent and epitome of energy, youth can be a transforming force in the society. Climate change perception and awareness is critical for making informed life-style choices and decisions. India is highly vulnerable to climate change impacts owing to its topography and geographical location at the same time being a young nation with largest young population in the world, has a demographic advantage as well. Indian youth is aware and actively participating in climate action, spreading word about it and raising awareness, motivating people to make lifestyle changes and alter consumer behaviour to reduce carbon foot print and conserve resources. [2] Indian youth, therefore can play a critical role in climate change adaptation and mitigation. As climate change perception is an intricate phenomenon dependent on number of determinants ranging from personal experience to information received, belief, culture as well as on geographical region it may vary considerably [3,4,5,6,7]. Comprehending youth's perception of climate change is as crucial for designing effective scientific communication as it is for designing and adoption of adaptation and mitigation strategies. Not many studies had been carried out to understand climate change awareness level of undergraduates, especially in India [8,9]. Universities certainly play a significant role in spreading and enhancing

climate change awareness [10,11,12] but the result seems to be inadequate and vary across the globe [13,14,15]. This study was carried out to gauge climate change perception and awareness of undergraduates of University of Delhi. The study was designed to understand the awareness level, perception of climate change, factors influencing the awareness and sources of information on climate change, of undergraduates.

## 2. Material and Methods

The study was conducted employing a descriptive online survey as research instrument, designed to collect data on specific variables under study. The survey questionnaire, titled 'Climate change awareness of undergraduates' consisted of carefully designed sets of questions addressing the research problem, using Google Forms. Questions were created using multiple choice grid with – 'require a response in each row', option enabled. The survey questionnaire adopted 4-point Likert-type scale to offer an ordered continuum of possible response options as strongly agree, agree, disagree and strongly disagree, to gather a more effective response from the subjects. Undergraduates who volunteered to be part of the research study were informed that confidentiality will be maintained. The random population sample consisted of 364 undergraduates from various streams. The responses were collected and analysed.

**Data analysis:** Internal consistency within the survey was obtained by calculating the correlation coefficient for each scale. The Cronbach's alpha coefficient was used and value obtained was 0.88.

## 3. Results

The result of the survey presented in Table 1 depicts the climate change awareness level of undergraduates. Out of 364 participants 355 (97.52%) agreed that climate change is

for real while 9 (2.48%) disagreed. Also, 97.80% participants agreed that it's a global issue while 2.20% disagreed. 98.08% of the participants also believed that climate change is exhibited in different forms across the globe while 1.92% refused to believe. Result also makes it clear that 92.86% considered climate change as an urgency demanding immediate attention while 7.14% didn't agree. Further, 73.63% were aware of the Intergovernmental Panel for Climate Change (IPCC) while 26.37% were unaware. A total of 337 participants (92.58%) were also aware of the fact that earth is 1.5° C warmer than pre-industrial levels though 27 (7.42%) were unaware. Also, 92.31% of the participants believed that another 0.5° C rise will be concerning while 7.69% disagreed.

**Table 1:** Level of awareness of climate change

Parameter	Response Classification	Frequency	Percentage
Climate change is for real	Yes	355	97.52
	No	9	2.48
Climate change is a global issue	Yes	356	97.80
	No	8	2.20
Climate change is exhibited in different forms across the globe	Yes	357	98.08
	No	7	1.92
I see climate change as an urgency demanding immediate attention	Yes	338	92.86
	No	26	7.14
I am aware of Intergovernmental Panel for Climate Change (IPCC)	Yes	268	73.63
	No	96	26.37
I know the earth is 1.5°C warmer than pre-industrial levels	Yes	337	92.58
	No	27	7.42
Another 0.5°C rise will be concerning	Yes	336	92.31
	No	28	7.69

**Table 2:** Perception on climate change

Parameter	Response Classification	Frequency	Percentage
Climate change is majorly a result of human activities	Yes	323	88.74
	No	41	11.26
Climate change leads to melting of Glaciers	Yes	356	97.80
	No	8	2.20
Climate change leads to increase in surface temperature of earth	Yes	358	98.35
	No	6	1.65
Climate change leads to rise in sea levels	Yes	351	96.43
	No	13	3.57
Climate change enhances frequency of extreme weather events (e.g. cyclones, heat waves, flooding and heavy rainfall)	Yes	356	97.80
	No	6	2.20
Climate change leads to longer duration of droughts	Yes	344	94.51
	No	20	5.49
Climate change poses threat to Biodiversity	Yes	356	97.80
	No	6	2.20
Climate change impacts agriculture productivity negatively	Yes	351	96.43
	No	13	3.57
Climate change poses threat to food security	Yes	345	94.78
	No	19	5.22
Climate change exacerbates water crisis	Yes	340	93.41
	No	24	6.59

Climate change widens the socio-economic gap	Yes	325	89.29
	No	39	10.71
Climate change disturbs economy	Yes	332	91.21
	No	32	8.79

In the present study result regarding climate change perception of undergraduates (table 2) indicated that 88.74% participants believed climate change is majorly driven by anthropogenic activities while 11.26% participants disagreed. 97.80% also agreed that climate change leads to melting of glaciers though 2.20% disagreed. It is also believed by 98.35% that climate change leads to increase in surface temperature of earth while 1.65% disagreed. 96.43% participants agreed that climate change leads to rise in sea levels while 3.57% disagreed. Also, 97.80% were convinced that climate change fuels frequency of extreme weather events while 2.20% disagreed. Further, 94.51% believed that climate change leads to extended drought period though 5.49% disagreed. 97.80% participants agreed that climate change poses threat to biodiversity while 2.20% disagreed. It was also found that 96.43% participants believed that climate change adversely impacts agricultural productivity though 3.57% disagreed. 94.78% agreed that climate change poses threat to food security while 5.22% disagreed. Also, 93.41% participants believed climate change exacerbates water crisis while 6.59% participants disagreed. Result also indicated that 89.29% believed that climate change widens the socio-economic gap while 10.71% differed in their opinion. 91.21% were of the opinion that climate change disturbs the economy while 8.89% disagreed.

**Table 3:** Factors influencing level of awareness on climate change

Parameter	Response Classification	Frequency	Percentage
<b>Educational/participatory activity</b>			
concept of climate change taught at school level raises awareness	Yes	331	90.93
	No	33	9.07
being part of nature and environment/Eco club at college level raises and/or improves awareness	Yes	353	96.98
	No	11	3.02
readings about climate change raise and/or improve awareness	Yes	352	96.70
	No	12	3.30
being part of NGOs working on environmental issues / environmental organisations raises and/or improves awareness	Yes	356	97.80
	No	8	2.20
<b>Public source</b>			
environmental issues taught using media can raise and/or improve awareness	Yes	345	94.78
	No	19	5.22
Environmentalists'/ civil rights activists' movement/protest rallies help to raise and/or improve awareness	Yes	323	88.74
	No	41	11.26
<b>Personal experience</b>			
changing weather pattern(e.g. erratic rainfall patterns, excessive heat during summers and shortening of winters) is noticeable by everyone	Yes	331	90.93
	No	33	9.07
increased frequency of extreme events (e.g. Cyclones, floods, heavy rainfall) is noticeable by	Yes	320	87.91
	No	44	12.09

everyone			
<b>Government actions</b>			
Government response to climate crisis influences climate change awareness	Yes	307	84.34
	No	57	15.66
Laws constituted /actions taken by government to mitigate/reduce climate risks influence climate change awareness	Yes	320	87.91
	No	44	12.09

The study also tried to understand the undergraduates' perception of the factors that influence the awareness level on climate change (Table 3). The result indicated that 90.93% believed that concept of climate change taught at school levels contributes to climate change awareness while 9.07% didn't find it influencing. Also, 96.98% considered eco-clubs an influential factor in raising climate change awareness while 3.02% disagreed. 96.70% also believed that reading about climate change can improve awareness level while 3.30% disagreed. Being part of Non-Governmental Organisations (NGOs) working on environmental issues and/or environmental organisations was considered a contributing factor, raising awareness level by 97.80% while 2.20% disagreed. Also, it was found that 94.78% believed in the power of media in spreading the word, disseminating information and enhancing awareness while 5.22% didn't find media as an influencer in raising awareness. Further, the result indicated that 88.74% believed that environmentalists'/civil rights activists' movement or protest rallies also work as factors improving awareness level on the issue of climate change while 11.26% disagreed. Personal experiences like changing weather pattern, extension of summers and shortening of winters and other such phenomenon are noticeable and these experiences can contribute in enhancing awareness level was believed by 90.93% of participants while 9.07% disagreed. Increased frequency of extreme weather event was also believed by 87.91% as a factor all are experiencing and making people aware of ongoing climate change while 12.09% refused to consider it as a factor influencing awareness level. Also, 83.34% believed that government's response to climate crisis influences awareness level while 15.66% disagreed.

Laws constituted or climate change mitigation actions taken by government was also believed to be influencing awareness level by 87.91% while 12.09% disagreed

The result of accessibility of undergraduates to the sources of information on climate change (table 4) indicated that 90.11% feel that the topics taught at secondary school served as source of information on climate change and related issues while 9.89% disagreed. At college the courses/papers they have opted for is their source of climate change information was believed by 82.69% of the participants while 17.31% didn't believe so. 75.28% were of the opinion that the books they read are the source of climate change information while 24.72% disagreed. A higher percentage (84.07%) of participants believed that research papers/reports they read serve as source for information on climate change while 15.93% disagreed. Documentaries on television served as source of information for 88.19% while 11.81% disagreed. 83.79% were of the opinion that radio/television programmes are the sources to obtain information while 16.21% differed in opinion. Social media was considered as source of information on climate related issues by 87.91% participants while 12.09% disagreed. However, a higher percentage (92.31%) of participants found newspapers and magazines as their sources to obtain information on climate change related issues while 7.69% disagreed. 80.22% believed that parents, siblings and/or guardians are their sources of information on the issue while 19.78% disagreed. Further, 76.10% agreed that peers, friends and/or relatives serve as sources of information on climate change while 23.90% disagreed. 73.35% participants believed excursion/field trips help them to get information on climate change while 26.65% disagreed. Lectures/seminars/workshops attended by participants were valued as sources of information on climate change by 83.24% while 16.76% disagreed. 96.15% agreed that internet serves as source to obtain information while 3.85% disagreed. Smart phones were valued as source to get information on climate change by 94.23% while 5.77% had a different opinion.

**Table 4:** Accessibility to sources of information on climate change

Source of information on climate change response	Classification	Frequency	Percentage
<b>Education</b>			
My source of information is subjects/topics studied during secondary school days as part of curriculum	Yes	328	90.11
	No	36	9.89
My source of information is courses/ papers opted for at college	Yes	301	82.69
	No	63	17.31
My source of information is books I read	Yes	274	75.28
	No	90	24.72
My source of information is research reports/papers I read	Yes	306	84.07
	No	58	15.93
<b>Media and home</b>			
My source of information is documentaries on television	Yes	321	88.19
	No	43	11.81
My source of information is radio/TV Programmes	Yes	305	83.79
	No	59	16.21
My source of information is social media (Facebook, Instagram, twitter, podcast etc.)	Yes	320	87.91
	No	44	12.09
My source of information is newspapers and magazines	Yes	336	92.31
	No	28	7.69
My source of information is parents/ guardians/siblings	Yes	292	80.22
	No	72	19.78



My source of information is peers friends/relatives	Yes	277	76.10
	No	87	23.90
<b>Seminars/workshops/educational trips</b>			
My source of information is excursions/ field trips	Yes	267	73.35
	No	97	26.65
My source of information is seminars/ lectures/workshops I attend	Yes	303	83.24
	No	61	16.76
<b>ICT</b>			
My source of information is Internet	Yes	<b>350</b>	<b>96.15</b>
	No	<b>14</b>	<b>3.85</b>
My source of information is Smart phone	Yes	<b>343</b>	<b>94.23</b>
	No	<b>21</b>	<b>5.77</b>

#### 4. Discussion

One of the requisites for achieving the goal of an effective climate action is involvement of all the stakeholders. Without a proper understanding of the climate change, its causes and impacts, a transformative action is impossible. Youth represents the future of this planet and thus its role is crucial in combating climate change. In the present study undergraduates from various colleges of University of Delhi were found to be highly aware of the issue, however a small percentage of students were found not accepting the idea of climate change. This could be due to several reasons as individuals' perception is influenced by a gamut of factors ranging from the information received to age, gender, political ideology, circumstantial influences, personal experience, belief, culture as well as geographical region [3,4,5,6,7]. As perception is an intricate and subjective phenomenon driven by a range of elements it may vary considerably from one individual to another within a local area and therefore different individuals experiencing the same conditions and weather patterns might have different climate change perception. Irrespective of the reasons responsible for participant's incorrect perception about climate change and lacking awareness on the issue, its really concerning that today when the impact of climate change is visible in diverse forms [16] and being experienced both locally and globally, a fraction of youth is yet to believe that climate change is actually happening. Apart from this small percentage of students, majority had correct perception of climate change and were well aware of the issue, its manifestations and impacts. This is in contrast with another study where undergraduates of An-Najah National University Palestine, were reported to have lower awareness level [17]. In a comparative study made between undergraduates from two different Universities huge difference was reported in the awareness levels of students. Undergraduates of University of Botswana were more aware of the climate change and its impacts as compared to undergraduates of the U.S. Naval Academy (USNA) [18], suggesting that people in developing countries and getting more impacted by climate change related issues are probably more aware of the challenge and its seriousness. In another study involving students of United Arab Emirates University (UAEU) it was reported that science students had a better awareness on issues related to environment and phenomena like greenhouse effect and global warming [19]. In another study focused on science students of University of Bahrain it was found that more than 50% the students were aware of issues like global warming and the awareness level was not uniform across different science disciplines [20]. In the

present study students from science as well as non-science disciplines participated and though attempt was not made to investigate the impact of discipline on awareness level of students, a very low percentage of participants seem to lack awareness, indicating that discipline probably had no role in the perception and awareness level of students of University of Delhi. The result of study determining the factors influencing participants' level of awareness indicated that majority of participants believe that climate change education at school level, reading about the issue, being part of Nature and Environment club at college or NGOs working in the field of environment, public sources on climate change awareness, personal experiences and Government's actions, all influence and help to enhance the awareness. However, a closer examination of the data indicated that students find participatory activities more influential as compared to others factors. The reason could be the scope of being an activist and be on the ground, transforming ideas into action. This clearly showed that students prefer being actively engaged in exercises related to environment and reflected their willingness to contribute for climate action. This result is also in consistency with a recent report finding published by British council [21] stating that 78% of Indian youth is highly willing to participate in exercises directed to tackle climate change. Further, it was also highlighted that Indian youth finds schools and universities are playing significant role in raising awareness, a finding which supports the result of present study where participants agreed that concepts taught at school level as part of curriculum and papers opted for at college level were helpful in raising awareness about the climate change. The report further added that Indian youth struggles to get opportunities to be part of problem solving due to several factors such limited digital access, exclusion of youth resulting from hierarchy based social organization and lacking access to training and skill development. The result on accessibility to various sources of information on climate change suggested that majority of students consider school curriculum, papers opted for at college, books and research papers, print, electronic and digital media, seminars and smart phones as sources for gathering information on climate change. A higher percentage (96.15%) of students agreed that internet serves as their source of information while 87.91% participants found social media as an effective source of information on climate change. This difference in response towards internet and social media as source of information could be because of two reasons: a) there is a possibility that a fraction of participants clubbed internet and social media together resulting in a higher percentage of response favouring internet as source of information, b) a fraction of students didn't find social media as an authentic

source of information on climate change and probably rely more on official websites.

## 5. Conclusion

This study clearly indicated that undergraduates from various colleges of University of Delhi, India are aware of the climate change emergency. Their perception of climate change and its impact as reflected in the result, establishes they have a sound knowledge on the issue and thus we need to frame defining roles for these young minds who have the potential to be future youth climate leaders and can be the harbinger of change. Government and policymakers need to take critical inputs from these young minds into account for improvement of existing climate action initiatives and framing policies and action plan to combat climate change as well strategies for climate change adaption and mitigation. However, the study also indicated a small percentage of undergraduates are yet to believe in climate change and consider it a global emergency and thus highlights the fact that we need to identify and address gaps in our climate change related information and communication strategies. The present study population was a random sample consisting of undergraduates from various streams/courses. Further studies designed to understand climate change perception and awareness level of science and non-science undergraduates can provide a deeper insight. Also, nationwide studies will present a better picture on the undergraduates' awareness level on the issue. Based on the encouraging result of present study author suggests that climate change adaptation and mitigation- training workshops and/or programmes aimed to equip these undergraduates with the right skill set, will help to translate this knowledge into action.

## References

- [1] <https://www.undp.org/publications/peoples-climate-vote>
- [2] [https://www.teriin.org/sites/default/files/files/Youth-Climat-Conclave\\_Booklet\\_2020.pdf](https://www.teriin.org/sites/default/files/files/Youth-Climat-Conclave_Booklet_2020.pdf)
- [3] Van der Linden, S. (2015). The Social-Psychological Determinants of Climate Change Risk Perceptions: Towards a Comprehensive Model. *J. Environ. Psychol.* 41, 112–124. doi:10.1016/j.jenvp.2014.11.012
- [4] Whitmarsh, L., and Capstick, S. (2018). "Perceptions of Climate Change," In S. Clayton, and C. Manning (Eds.) *Psychology and Climate Change: Human Perceptions, Impacts, and Responses.* (pp. 13–33). Academic Press, doi:10.1016/B978-0-12-813130-5.00002-3
- [5] Lee, K, Gjersoe, N, O'Neill, S, Barnett, J. (2020) Youth perceptions of climate change: A narrative synthesis. *WIREs Clim Change.* 11: e641. <https://doi.org/10.1002/wcc.641>
- [6] Weber, E.U. (2010), What shapes perceptions of climate change? *WIREs Clim Change*, 1: 332-342. <https://doi.org/10.1002/wcc.41>
- [7] Weber, E.U. (2016), What shapes perceptions of climate change? New research since 2010. *WIREs Clim Change*, 7: 125-134. <https://doi.org/10.1002/wcc.377>
- [8] Pandve, H.T.; Deshmukh, P.R.; Pandve, R.T.; Patil, N.R. Role of youth in combating climate change. *Indian J. Occup. Environ. Med.* 2009, 13, 105.
- [9] Al-Naqbi, A.K.; Alshannag, Q. The status of education for sustainable development and sustainability knowledge, attitudes, and behaviors of UAE University students. *Int. J. Sustain. High. Educ.* 2018, 19, 566–588.
- [10] Trippel, M.; Sinozic, T.; Lawton Smith, H. (2015). The role of universities in regional development: Conceptual models and policy institutions in the UK, Sweden and Austria. *Eur. Plan. Stud.* 23, 1722–1740
- [11] Sanni, M.; Adejuwon, J.O.; Ologeh, I.; Siyanbola, W.O. (2011) Path to the Future for Climate Change Education: University Project Approach. In *The Economic, Social and Political Elements of Climate Change*; Springer: Berlin, Germany, pp. 693–702.
- [12] Wachholz, S.; Artz, N.; Chene, D. (2014) Warming to the idea: University students' knowledge and attitudes about climate change. *Int. J. Sustain. High. Educ.*, 15, 128–141.
- [13] Leal Filho, W. (2009) Communicating climate change: Challenges ahead and action needed. *Int. J. Clim. Chang. Strateg. Manag.* 6, 522011.
- [14] Holtsmark, B. International cooperation on climate change: Why is there so little progress? In *Handbook on Energy and Climate Change*; Edward Elgar Publishing: Cheltenham, UK, 2013. [Google Scholar]
- [15] Leal Filho, W.; Shiel, C.; Paço, A.; Mifsud, M.; Ávila, L.V.; Brandli, L.L.; Molthan-Hill, P.; Pace, P.; Azeiteiro, U.M.; Vargas, V.R.; et al. (2019) Sustainable Development Goals and sustainability teaching at universities: Falling behind or getting ahead of the pack? *J. Clean. Prod.* , 232, 285–294.
- [16] Das, A. (2021). Climate Change and Myriad Ways Its Impacting the World; *International Journal of Scientific and Research Publications.* 11(12) (ISSN: 2250-3153), DOI: <http://dx.doi.org/10.29322/IJSRP.11.12.2021.p12006>
- [17] Demaidi, M. N., & Al-Sahili, K. (2021). Integrating SDGs in Higher Education—Case of Climate Change Awareness and Gender Equality in a Developing Country According to RMEI-TARGET Strategy. *Sustainability*, 13(6), 3101.
- [18] Moswete, N.M.; Manwa, H.; Purkitt, H. Perceptions of College Students towards Climate Change, Environmental, and Tourism Issues: A Comparative Study in Botswana and the US. *Int. J. Environ. Sci. Educ.* 2017, 12, 1175–1193
- [19] AbuQamar, S.; Alshannag, Q.; Sartawi, A.; Iratni, R. Educational awareness of biotechnology issues among undergraduate students at the United Arab Emirates University. *Biochem. Mol. Biol. Educ.* 2015, 43, 283–293
- [20] Freije, A.M.; Hussain, T.; Salman, E.A. Global warming awareness among the University of Bahrain science students. *J. Assoc. Arab. Univ. Basic Appl. Sci.* 2017, 22, 9–16
- [21] [https://www.britishcouncil.org/sites/default/files/global\\_youth\\_letter\\_-\\_final\\_report.pdf](https://www.britishcouncil.org/sites/default/files/global_youth_letter_-_final_report.pdf)