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Data-Driven Insights into Climate Action: Youth Perspectives and Motivations

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ABSTRACT: With the continuous growth of human civilization and industrial advancements we observe the rising pressure on environmental resources becoming more and more evident. The by-products of all the industrial activities be it mining, extraction, manufacturing and others all lead to the release of by-products that hamper the environment at large. This research study aims to gauge the evidence, the awareness, perception and the action drive amongst the youth regarding the same. Climate change being the central theme of the research paper dives deeper into understanding the level of awareness, the perceptions formed and the eventual outcome of whether it leads to actions against curbing climate change or not. This research paper tries to uncover the mind-set and willingness of the youth to lead a change for the better tomorrow. Furthermore, the paper dives deeper into exploring new discoveries and assumptions in order to understand the action taking capabilities of the youth as per the level of awareness and the level of positive perception that the respondents have.

KEYWORDS: carbon footprints, SDG, ESG, youth, climate change, climate change awareness, climate change perception, climate action, climate change mitigation.

I. A BRIEF MICROSCOPIC OVERVIEW

Today, as we aim for mutual growth with the substantial development of our industries and economies we tend to discount the aftermath of our actions. Climate change, a pressing issue at hand, is growing largely potent, making it a high time for nations worldwide to devise an action plan towards its mitigation. Presently we see the rise in temperatures has led to the aggravation of many environmental issues like the loss of snow cover and arctic sea ice in the northern hemisphere (MacCracken, 2008). Many more such issues have been cropping up due to the aggravation of climate change. Climate change has led to a disruption in the seasonal cycles in many countries. In a country like India where the seasonality is predictable, now it is increasingly becoming difficult to predict seasonal conditions (especially monsoons) due to the shift in climatic conditions. The monsoon variability has increased tremendously causing scanty rainfalls in many regions the consequence of which is the rise in drought prone zones in India (Lal, 2003). The advent of climate change can be observed all over the world.

Back in the days, especially during the 1980's scientists started observing a change in the ozone layer composition. This is where the grim reality of the industrial revolution started to affect atmospheric stability. The major cause cited behind the depletion of the ozone layer was the humongous release of chlorofluorocarbons. To curb the changes, the Montreal Protocol was signed in the year 1987 which aimed at identifying the substances that harmed the ozone layer and the methods to curb their emissions. The United Nations Development Programme (UNDP) has played a vital role in driving the sustainability drive throughout the world with the introduction of the 17 Sustainable Development Goals (SDGs). Today, worldwide we see organizations and societies taking efforts to curb their carbon footprints to stay in line with the SDGs and to facilitate a greener and a brighter tomorrow.

Climate Awareness and Perception in India

In India, we see that with the advancement of technology the landscape of manufacturing and production has seen a few disruptions. Many businesses have switched towards more sustainable production facilities in order to meet the Environmental, social, and governance (ESG) criteria put forth by Securities and Exchange Board of India (SEBI) and the ministry of corporate affairs. In the past few years, we have also seen a rise in ESG compliance and regulations. Earlier it was a voluntary requirement but now SEBI has made it mandatory for the top 1000 listed companies by market capitalization to mandatorily file ESG reports as an effort to drive sustainable business practices in India. This remarkable initiative has laid down many such crucial quantifiable Key Performance Indicators (KPIs) that help businesses account for the emissions and footprints they tend to create in the quest of profit.



India has been driving its efforts to mitigate the effects of climate change through the adoption of various policies throughout the years. We see how in 2008 the National Action Plan on Climate Change (NAPCC) was released in order to outline the action plan for India in the coming future. It also happened to be the first policy that helped bring together the Ministry of Environment and Forest and the Ministry of Renewable Energy under one roof in order to work for the betterment of the climatic conditions and to strengthen the overall efforts undertaken to mitigate climate change (Chaudhary, Narain, Krishna, & Sagar, 2014). Hence, we see how tremendously the nation has been striving towards conserving the environment as a whole.

Now, the ultimate power to lead the change happens to lie in the hands of the youth as they proceed to becoming the working class for the next few decades to come. According to an article in *The Economic Times* (2024), India's youth segment is set to touch 420 million in the year 2024, comprising twenty-nine percent (29%) of the total population. These young individuals are holding crucial power to have an impact on India's future.

Hence, it becomes crucial to sensitize the youth about climate change and the repercussions it tends to tag along. This research study tries to understand the level of awareness and the perception about climate change on a sample of respondents that might help in gaining insights into what exactly the sentiments of the youth are with regards to the environmental deterioration and climate change.

II. LITERATURE REVIEW

The secondary data analysis was done through gauging notable literary articles and research papers to understand how deep researchers have undertaken studies to evaluate the penetration of climate change awareness and perception amongst the youth across the world. For the same, 12 research papers were reviewed that cover various aspects of climate change awareness, perception and climate action. The ability to lead the change lies in hands of the youth today and an essence to prove this statement is India's six-year-old climate activist Kangujam who has led many climate change activism in India and has also addressed world leaders at many such climate change summits across the globe (Hammond, 2023). On the similar lines we found out another enthusiast in India who finds climate change to be a very concerning issue for him – Mr. Manav – a seventeen year old born in India and currently residing in Long Island has been constantly trying to do his part in mitigating climate change through climate action related tasks which include articles to extreme exercises like strikes as a member of the Fridays for future and Extinction Rebellion (Sabharwal, 2020).

When we try to assess the attitude and perception people have towards climate change, we see wide differences in the perspectives of different people. Especially the youth, some feel anxious about the changes happening around and may feel depressed or pessimistic about the future while others tend to characterize their need to mitigate climate change through the various concerns, they have which may be social-altruism, egoistic concern or a biospheric concern (Annalakshmi, Arthe, & Keerthana, 2020). It is essential to realize that when we consider India as a whole and study its demographics we realize how vulnerable the people of India are to the after effects of climate change as India constitutes about one third of the world's poor population and hence many do not have the capabilities to deal with any new issues cropping up due to climate change (Padukone, 2010). Uncovering the niche aspects of climate change studies, we discovered something really important in a research paper that dived deeper into understanding how exactly are farmers hit by the climatic shifts as India is an agrarian country, the study specifically focused on studying the geographical implications of climate change, especially narrowing down on how Northern India hits the hardest of the climate change outcomes (Jacoby, Rabassa, & Skoufias, 2011).

Furthermore, studies conducted on why youth play a pivotal role in leading climate action drive helps enhance the significance of the study. In one of the studies conducted, the results showcased that one third of the youth in India believes in reducing their energy consumption in the next five years to come, this in turn showcases the potential the youth possess to lead the change (Kaur, Gupta, & Syal, 2014). The other most important factor driving climate action is the level of education where the study suggested that the ones with a higher qualification had more knowledge regarding climate change as compared to the ones with no to some level of education (Leiserowitz & Thaker, 2012). India specifically being a young nation, with its youth coming into power and taking up the upcoming leading roles have the responsibility of helping India transition from being environmental issue ridden country to a more sustainable and green nation (Chadha & Chadha, 2023). The ever more reason why this study becomes significant is because the youth is adaptable and hence has the potential power to adapt to the changes and enunciate the need for such adaption with minor actions like participating in state, national level climate action drives and focusing on reducing their carbon footprints (Pandve, Deshmukh, Pandve, & Patil, 2009).



III. RESEARCH METHODOLOGY

The research methodology used for this research paper is an exploratory and descriptive research methodology. This research paper tries to gauge the dependency of variables on each other and the possible outcomes/conclusions, and this is in the nature of exploring a new phenomenon. Exploratory research is where one tries to discover new findings through the conduct of research. For the purpose of exploration, the researchers used primary data collection methodology which allowed us to gather information on questions that tested the viability of hypothesis framed for this research work.

Research Design

The research design here is exploratory research design wherein primary data was the source for all the data collection and findings. Since most of the data was of qualitative nature, the qualitative data was converted into quantifiable terms in order to use statistical analysis tools like regression analysis which helped us to gauge the level of dependency.

The research design uses a mix of qualitative and quantitative tools to analyse data and arrive at a conclusion. Literature review was done to identify the gaps in the research and attempt was made to discover something new by undertaking an exploratory research work by the use of primary data sources such as questionnaires.

Research Objectives

The research objectives for this study are:

- To check the impact of climate change awareness and perception on climate action
- To check the impact of gender-wise climate awareness and perception on action
- To check the impact of age-wise climate awareness and perception on action
- To understand the level of individual actions undertaken by the youth
- To understand the perception of the youth towards climate change

Research Hypothesis

Following are the hypothesis tested in the study undertaken:

Hypothesis 1: Relationship between respondent's awareness and perception level on their action towards climate change.

H_0 : There is no linear relationship between respondent's awareness and perception level on their action towards climate change.

H_1 : There is significant linear relationship between respondent's awareness and perception level on their action towards climate change.

Hypothesis 2: Respondent's gender's impact on their awareness level about carbon footprint

H_0 : Respondent's gender has no association with the awareness level of carbon footprint

H_1 : Respondent's gender has association with the awareness level of carbon footprint

Sampling

The sampling method used in this research paper is stratified sampling method. The samples were divided into different strata on the basis of age groups. The sample size for the research was 122 respondents.

Data Collection

Since the data collection was through primary sources, Google forms were used to collect primary data. A total of 29 questions were asked of which 4 were demographic questions, 9 perception-based questions and 3 awareness-based questions and 13 action based questions.

Variables

Climate change awareness, Climate change perception, Climate action, Age groups (21-25 years, 26-30 years), Gender

Significance of the Study

Climate change is becoming a prevalent issue and possesses a potential threat for the future generations to come. It becomes vital for us to take a step towards initiating the change and eventually lead it. Through this study, it was aimed to discover how the level of awareness and the perception that youngsters have, does it actually lead to them



undertaking any actions or not. The significance of this study is that through the findings and revelations one can understand what factors need to be changed or improved in order to facilitate more actions.

As per the findings, it is found that people having a positive perception do undertake actions to fight climate change and that awareness alone doesn't help in doing so. This revelation can help in devising better strategies to improve the perception even further thereby accelerating the climate actions undertaken.

The study could also help institutions better understand what efforts they need to make in order to boost the climate action drive amongst the youth. It can then facilitate perspective courses that help shape the mind-set required for a sustainable future.

This research paper could also prove to be a good starting point for start-ups, course providers focused on ESG. The analysis and hypothesis tested and the results could be used as the fundamentals to introduce new initiatives and figure out ways to boost the climate action vigour amongst the youth. The action-based questions analysed depicts the habitual curtailments that the youth undertake in order to curb climate change.

IV. DATA ANALYSIS AND HYPOTHESIS TESTING

Descriptive analysis and inferential statistics were used to analysed the collected data for this research. Descriptive analysis was done for the summarization of data with the help of percentage, charts, mean and standard deviation. The descriptive data analysis is as under:

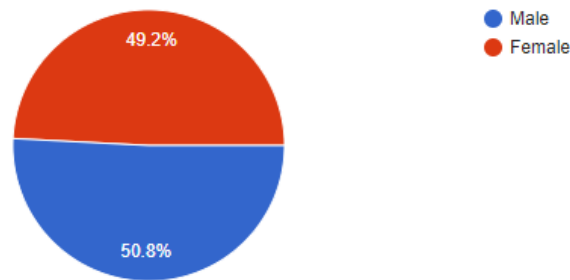


Figure 1: Respondent's Gender

Analysis of Figure 1 shows that 50.8% of the respondents are male while 49.2% are female.

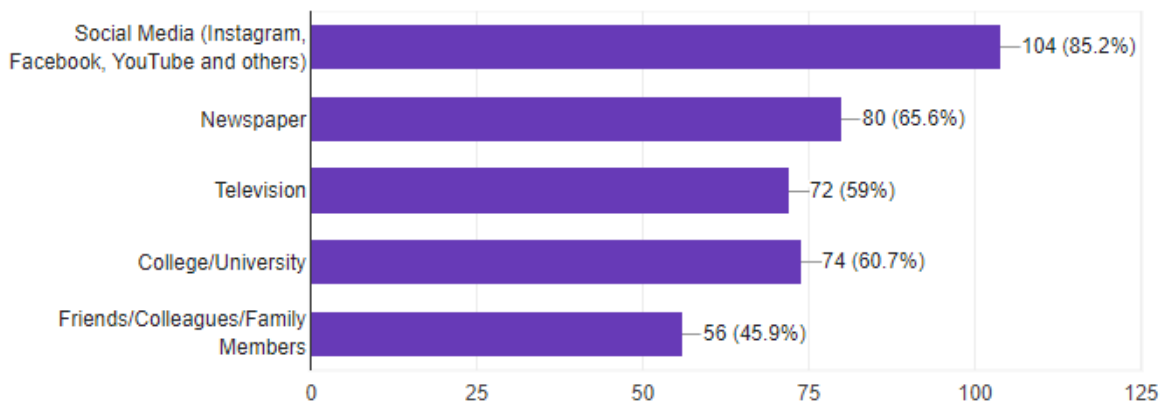


Figure 2: Respondent's Awareness of Climate Change

Analysis of Figure 2 states that most of the respondent heard about the climate change from social media (85.2%), followed by newspapers (65.6%) and college/university (60.7%).



Table 1: Action Based Activities

Q1.	How often do you take a bucket bath?	Never 4.9%	Rarely 12.3%	Sometimes 13.1%	Often 15.6%	Always 54.1%
Q2.	How often do you prefer public transport over your own vehicle?	Never 3.3%	Rarely 10.7%	Sometimes 17.2%	Often 32%	Always 36.9%
Q3.	How often do you prefer carrying your own bag for grocery shopping?	Never 1.6%	Rarely 9%	Sometimes 18%	Often 26.2%	Always 45.1%
Q4.	Which of the following types of vehicles do you own/use?	Petrol/Diesel 60.7%	CNG 8.2%	EV 3.3%	None 27%	Cycle 0.8%
Q5.	How often do you participate in clean up drives?	Never 18.9%	Rarely 34.4%	Sometimes 36.9%	Often 6.6%	Always 3.3%
Q6.	How likely are you to support solar energy panel installation for your household energy usage?	Extremely Unlikely 1.6%	Unlikely 4.9%	Neutral 18%	Likely 44.3%	Extremely Likely 31.1%
Q7.	Are you a member of any social committee that undertakes climate change initiatives?	Yes 23.8%	No 75.4%	At times participated in activities 0.8%	NA	NA
Q8.	How likely are you to take courses listed on the following website: MAHA Youth for Climate Action (MYCA)?	Extremely Unlikely 7.4%	Unlikely 14.8%	Neutral 46.7%	Likely 25.4%	Extremely Likely 5.7%
Q9.	How often do you prefer taking digital notes?	Never 0.8%	Rarely 10.7%	Sometimes 34.4%	Often 35.2%	Always 18.9%
Q10.	How many trees have you planted in order to give back to the planet?	0 12.3%	1-5 51.6%	6-10 19.7%	10+ 16.4%	NA



Q11.	How likely are you to refuse the waiter from adding water to your glass if not needed when in a restaurant?	Extremely Unlikely 4.1%	Unlikely 9.8%	Neutral 18.9%	Likely 35.2%	Extremely Likely 32%
Q12.	How likely are you to take an immediate action in order to curb climate change if it comes at a monetary cost?	Extremely Unlikely 3.3%	Unlikely 4.1%	Neutral 37.7%	Likely 43.4%	Extremely Likely 11.5%
Q13.	How often do you happen to buy a new mobile phone?	0-1 years 0.9%	1-3 years 19.6%	4-6 years 50%	6+ years 2.7%	Other (Need) 26.8%

Analysis of Table 1 clearly confirms that the youth definitely have a positive perception towards mitigating climate change which can be understood through the analysis of the data points as mentioned above. The questions in the Table 1 are for understanding whether the sample respondents are undertaking individual actions or not and at what level. From the analysis of Table 1 data are as follows:

- 54.1% of youth respondents use bucket for bathing.
- 36.9% of the respondent prefer public transport instead of their own vehicles.
- 45.1% of the respondent carry their own cloth bags to grocery shopping.
- Only 3.3% of the youth respondents use electric vehicle and majority (60.7%) of them still uses petrol or diesel vehicles.
- Only 3.3% of the respondents are engaged in cleaning drive efforts.
- 44.3% of the respondents support solar energy panel installation for their household energy usage.
- 75.4% of the young respondents are not a member of any social committee that undertakes climate change initiatives.
- 46.7% of the respondents are not sure of taking courses that are listed on MAHA Youth for Climate Action (MYCA) websites.
- 35.2% of the respondents prefer taking digital notes.
- 51.6% of the respondents had planted 1-5 trees in the past.
- 35.2% of the respondents shows action towards reducing climate change by refusing water to be refilled in glass if not needed.
- 43.4% of the respondents are ready to action towards reducing carbon footprint if it comes with monetary benefits.
- Most of the respondents contribute in reducing carbon footprint by taking decision to exchange their mobiles in 4-6 years.

Hypothesis Testing

For the purpose of hypothesis testing, 3 questions (Q5 to Q7) were summed up to calculate awareness level; 9 (Q8 to Q16) questions were summed up to calculate perception level; and 13 (Q17 to Q29) questions were summed for calculating action level.

Hypothesis 1: Relationship between respondent’s awareness and perception level on their action towards climate change.

H_0 : There is no linear relationship between respondent’s awareness and perception level on their action towards climate change.

H_1 : There is significant linear relationship between respondent’s awareness and perception level on their action towards climate change.



Table 2: Linear Regression Model Summary – Climate Action Total

Model	R	R ²	Adjusted R ²	RMSE
H ₀	0.000	0.000	0.000	5.481
H ₁	0.211	0.045	0.020	5.425

Interpretation: Climate action was dependent variable and climate perception and climate awareness were independent variables. Table 2 output shows that the relation between the variables (R) 0.211 that depicts low correlation between the two variables. The total variations between the variables is 0.045 (R²) which means that 4% of the variance is in climate action score due to perception and awareness.

Table 3: ANOVA

Model		Sum of Squares	df	Mean Square	F	p
H ₁	Regression	162.054	3	54.018	1.835	0.144
	Residual	3472.938	118	29.432		
	Total	3634.992	121			

Note. The intercept model is omitted, as no meaningful information can be shown.

Interpretation: Table 3 shows the ANOVA test result that explains the Regression model as well as the Residuals. The F-value is statistically not significant as $p > 0.05$ (0.144). Therefore, the model explains that respondent's perception and awareness are not a significant predictor in respondent's climate action as $F(3, 118) = 1.835, p > 0.05$ (0.144)

Table 4: Coefficients

Model		Unstandardized	Standard Error	Standardized ^a	t	p
H ₀	(Intercept)	41.992	0.496		84.622	< .001
H ₁	(Intercept)	33.717	3.720		9.065	< .001
	Gender (2)	0.848	0.984		0.862	0.391
	AWARENESS TOTAL	0.080	0.130	0.055	0.614	0.540
	Total	0.263	0.131	0.181	2.000	0.048

^a Standardized coefficients can only be computed for continuous predictors.



Interpretation: Table 4 output shows respondent’s perception and awareness do not contribute statistically significantly to the model as p-value is $p>0.05$.

Hypothesis 2: Respondent’s gender has no association with the awareness level of carbon footprint

- H_0 : Respondent’s gender has no association with the awareness level of carbon footprint
- H_1 : Respondent’s gender has association with the awareness level of carbon footprint

Gender	No	Yes	Total
Female	5	55	60
Male	8	54	62
Total	13	109	122

	Value	df	p
X^2	0.669	1	0.413
N	122		

Analysis of Table 6, stated that there is no association of gender with the awareness level of carbon footprint as p-value (0.413) is more than 0.05, so we fail to reject null hypothesis. Thus, respondent’s gender has no association with the awareness level of carbon footprint concept.

V. FINDINGS

This research study found that the individual actions that incorporate day to day activities have the highest frequency of being conducted. Further, actions devoid of day-to-day practices seem to have a comparatively lower frequency of being executed. It is also researched that the respondents willing to adopt new greener solutions of practices is high as observed in question numbers 6, 9, 11 and 12. Further, inferential statistics validated that respondent’s gender has no association with the awareness level of carbon footprint concept.

VI. LIMITATIONS OF THE STUDY

The study takes into account certain generic questions in terms of climate change awareness and hence, no deviation can be seen in the answers of a few questions. Moreover, it is vital to note the timeframe taken to complete the study. Due to limited timeframe, we had to restrict ourselves from collecting large amount of data in order to speed up the analysis within the stipulated timeframe. Therefore, the sample size is 122 from Mumbai and need not represent the whole of India which may lead to biased responses. But, still the findings of this research can be extended to study youth efforts towards the climate action.

VII. CONCLUSION

The research findings of this study discover that the youth have the awareness regarding the existence of climate change but doesn’t necessarily happen to take any action towards its mitigation.

On the other hand, it was observed that having a positive perception on climate change can be mitigated does lead to actions.

Analysing the potential of action taking probabilities based on awareness and perception on a strata level signal a negative conclusion wherein we observe that both males and females though aware of climate change and having positive perception towards its mitigation do not really take actions as such. Hence, we conclude that gender cannot be the base for assuming whether actions are taken as per which gender one belongs to.



Similarly, when analysing the data based on individual age groups, we see that there is no age-group wise impact on climate action drive amongst the youth. This suggests that on an aggregate basis we see that youth having a positive perception towards climate change mitigation are actually potent in leading the role of change leaders and taking the necessary actions to mitigate climate change.

Hence, if we start intensifying the mediums through which the possibility of leading the climate change mitigation initiative can be conveyed, we can drive or intensify the actions undertaken to do so. Through the findings of the study, we understand that it is vital to showcase how individual actions could actually lead to change in the attitudes and perception that people have towards climate change.

Since the questionnaire was designed to minutely gauge the actions people undertake, we also got insights into what all actions the youth of India undertake on an individual level. We observe that many people tend to take actions on an individual level as a part of their effort towards curbing climate change. These minor actions could definitely help in the long run to create a sustainable tomorrow as observed in the findings above.

VIII. SUGGESTIONS

The study conducted under this research paper could serve as a good reference point for drawing further conclusions. Though we suggest caution while using the data as mentioned in the limitations, the sample size is small and hence may not necessarily reflect the true sentiment of the target population as a whole.

Following are some of the exclusive suggestions we would like to shed light upon:

- We suggest expanding the sample size in the further studies if necessary as it would help reduce the sample size biasness and minimize the sampling error.
- Moreover, the questionnaire can also be altered as per need in order to increase the weightage of the variables to be tested.
- Similarly, we would suggest other researchers to conduct study on individual variables tested here for a more in-depth study.

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