Climate consciousness: assessing climate change awareness in Gurugram, India

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Abstract

Purpose – The objective of this study is to explore the level of understanding and actions taken by the people of Gurugram (erstwhile Gurgaon) to mitigate the impact of climate change, given its critical importance as a global issue.

Design/methodology/approach – Using a qualitative approach, primary data were collected through in-depth interviews by means of semi-structured interview methods.

Findings – The findings indicate that while people are aware of climate change, the information is deficient for them to translate their knowledge into effective action. Some of the major challenges identified are lack of appropriate understanding, resources, education, motivation and government initiatives, as well as the old habits, peer influence, feeling of incapability and limited media exposure. To bridge the intention-action gap, it is recommended that people should be empowered to act desirably. There is a change need for awareness and education on ways to mitigate the effects of climate change. The study has implications for researchers, environmentalists, policymakers, non-government organizations and local residents of Gurugram.

Originality/value – This study provides unique insights into the understanding of climate change by the general public and challenges faced in taking pro-environment actions. It emphasizes the urgent need to create awareness and educate individuals about ways to mitigate the impact of climate change.

Keywords Climate change, Knowledge gap, Climate action, Climate consciousness, Awareness, Gurugram

Paper type Research paper

Introduction

Climate change is a pressing global issue of the present times, impacting health, well-being and environment worldwide (Ebi *et al.*, 2018). Nations are actively making strategies to mitigate the negative impact of climate change and are taking action to adapt to climate change leading to ambiguous outcomes and uncertainty such as natural disasters, loss of biodiversity and degradation of natural resources including air, water and land (IPBES, 2019). Urgent action is essential to bring back the balance in the natural world, calm down nature and reduce the climate-induced disasters (Adger, 2006; Kelman, 2020).

Understanding the idea of climate change

The term "climate change" was coined by the American geologist Wallace Broecker and gained popularity only in the 1980s (Broecker, 1975; Wallace-Wells, 2019). It is no longer an abstract concept and has emerged as a heuristic incident of our lifestyle (Nordhaus, 2007) with social, environmental as well as economic implications (Lee *et al.*, 2020; Mehta *et al.*, 2019).

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As we witness climate impacts such as global warming – rising temperatures, higher sea levels, melting glaciers and extreme weather (Cook *et al.*, 2016) – the concern over climate change grows. Reports show a 1.1-degree Celsius increase since pre-industrial times, projecting another 1.5-degree rise in the next two decades without intervention; sea levels have risen by approximately 20 cm since the 20th century began (IPCC, 2022).

Climate change poses a global threat as it intimidates anthropological and environmental well-being (Vitousek, 1992). Modern-day lifestyle is driven by energy-intensive habits; for instance, a person who used to travel by car comfortably, will feel inconvenience in using public transport. With increasing economic activities and the race for accumulation of resources to reflect social identity and quality of life, people use resources without giving a second thought (Arsel, 2023; Tol, 2009).

Anthropogenic activities such as use of non-renewable resources, fossil fuel combustion, deforestation and industrialization, are major contributors to climate change (Harvey *et al.*, 2022; Leiserowitz *et al.*, 2021).

Climatic in Gurugram

Located in the northern plains of India, Gurugram is a rapidly developing semi-arid city in Haryana and has developed at a very high pace (Pramanik *et al.*, 2021). With over 81% of the population engaged in manufacturing, processing, servicing and trading, it has emerged as a major metropolitan hub (Pramanik *et al.*, 2021; Chandramouli and General, 2011). Being part of the National Capital Region, there is a seamless development of trade and commerce (Aryal *et al.*, 2020; Mukherjee *et al.*, 2022; Guttikunda *et al.*, 2023). Gurugram's climate faces challenges, evident in deteriorating air quality and rising temperatures, mirroring global trends. Long dry spells are leading to water scarcity and a fall in the level of groundwater. Increasing energy demand and poor waste management system make the situation worse. Seasonal precipitation is minimal and the monsoon is showing a decreasing trend (Rajasivaranjan *et al.*, 2022). The sparse forest cover lacks density, with vegetation scattered throughout the district. The Climate Vulnerability Index also puts Gurugram as one of the vulnerable districts in Haryana, highlighting its sensitivity to droughts.

Government climate action

The Government of India is crafting policies to fulfill its National Determined Commitment and 2030 agenda. Initiatives include the National Action Plan on Climate Change and the International Solar Alliance. National Determined Commitment are not limited to India, rather it is the global effort to confront climate change challenges, particularly within the framework of the Paris Agreement. National Determined Commitment serve as individual country commitments to reduce greenhouse gas emissions and adapt to the impacts of climate change.

At the state level, Haryana promotes renewable energy by offering incentives and subsidies for solar, wind, hydropower, biomass and geothermal energy use. Haryana Renewable Development Agency (HRDA) encourages renewable energy use through incentives and subsidies (Bhuvaneshwari *et al.*, 2019; Jörgensen *et al.*, 2015). The government emphasizes efficient water management via conservation, rainwater harvesting and wastewater treatment. However, a proper waste management system is still lacking. Government awareness efforts on climate change are insufficient (Bhattacharyya *et al.*, 2020), with limited initiatives for promoting pro-environmental behavior.

Theoretical under-pining

Epistemologically, awareness bridges the knowledge gap and leads to desirable behavior (Zagzebski, 1996). The theory of planned behavior shows that well-informed people exhibit

favorable behavior; thus, creating awareness and spreading information about climate change will inspire desirable action (Ajzen, 1991). Knowledge and awareness are prerequisites for engaging people in desirable actions; without awareness of climate change's negative impact, people will not make efforts to mitigate or adapt. The constructivist theory of learning further states that by disseminating the knowledge and understanding through interactive and situational communication, the awareness in people can be created (Galtung, 1972).

From an interpretive perspective, that involves examining the subjective experiences, meanings and interpretations that people assign to a phenomena, in light of the escalating impact of climate change on life and livelihoods in Gurugram, the study explores how residents perceive, interpret and understand these changes (Burger, 1977; Munch, 1975). By delving into the lived experiences of people by uncovering their beliefs, values and world-views concerning environment challenges. This approach recognizes that addressing climate change requires not only technical solutions but also a deep understanding of social dynamics, cultural norms, and individual perspectives, shedding light on the human dimensions of climate change adaptation and resilience-building efforts in the local context.

The risk perception theory, which is a framework used to understand how individuals perceive and react to risks, including those associated with climate change, posits that people's climate change awareness shapes their perceived risk. According to this theory, people's awareness and understanding of a particular risk influence their subjective perception of its severity and their willingness to take action to mitigate it. As climate change is uncertain, it is not viewed as a direct personal threat, influencing individual reactions. Spatial and temporal detachment from climate change exists (Covello, 1995). Spatial detachment refers to the physical or geographical separation between individuals and the impacts of climate change, which can lead to a sense of distance or disconnect from the issues and temporal detachment pertains to the perception that the consequences of climate change will unfold gradually over time, often in the distant future, rather than in the present moment.

The current study intends to explore the level of awareness and understanding of the people about climate change and explore how climate consciousness can be created (Mohamed Shaffril *et al.*, 2020). It will examine existing knowledge, pro-environment behavior, information sources, trust and reliability shaping climate change perceptions.

It will explore to what extent people perceive climate change as a direct and personal risk of them or if they perceive it as a main environmental issue. It will also explore the understanding of the knowledge gap and identify needs-based strategies for empowering them (Kollmuss and Agyeman, 2002). Analyzing attitudes and responses, it aims to identify factors influencing climate change behavior in Gurugram and report residents' perspectives on assuming responsibility.

Need for climate change awareness in Gurugram

Climate change is a continuous process influenced by human actions (Kelman, 2020; Vitousek, 1992), posing a risk to the welfare and well-being of people in India due to its topography and rapid development (Sam *et al.*, 2020). Research shows varying global perceptions and responses to climate change across diverse contexts (Lee *et al.*, 2015). People are seen to have a very conservative attitude toward change and may resist adopting new practices that could help mitigate or adapt to climate change. This resistance can leave them less prepared to cope with the consequences of environmental shifts, such as extreme weather events or disruptions to traditional livelihoods, thus end up being the most vulnerable to the negative effects of climate change. Due to the lack of scientific understanding by the public, there is an incongruence of knowledge at different levels, emphasizing the need to educate people.

In India, especially in rural areas, there is a lack of awareness of climate change (Zeeshan *et al.*, 2021; Upadhyaya *et al.*, 2023; Azhoni and Goyal, 2018). Awareness varies by age, gender, education and income (Lee *et al.*, 2020). Urgent awareness-building is essential (Farrokhi *et al.*, 2020; Madrigano *et al.*, 2018; Van Der Linden, 2014).

The objective of current research is to uncover the individual concerns, understanding and responses to climate change. It will examine the contextual perception of people in Gurugram and their attitude and response to climate change.

Gurugram, a rapidly urbanizing and highly vulnerable area, encounters distinctive challenges tied to climate change. Studying Gurugram offers insights into local perceptions and contributes to a global understanding of climate change (Lee *et al.*, 2015). Previous Indian research highlights limited climate change awareness (Kwatra *et al.*, 2021; Zeeshan *et al.*, 2021). Despite global attention, Gurugram lacks localized studies on how residents understand climate change. This research offers an in-depth analysis, contributing to a broader understanding of climate change perceptions.

The study will have implications for researchers and organizations that are working on behavioral analysis of people toward climate change, non-governmental organizations working on environmental protection and policymakers.

Methodology

The phenomenological research design was used to explore public perceptions of climate change through daily experiences (Husserl, 2012). The qualitative research provided valuable insights into people's understanding of climate change in Gurugram. It explored Gurugram residents' beliefs, ideas and behaviors related to climate change (Bercht, 2021; Leavy, 2020). Open-ended interview questionnaires were utilized.

Sample size and interview time

Data from 123 respondents were collected between April and November 2022, spanning multiple seasons and ensuring a diverse range of perspectives. The interviews were conducted until saturation in responses was observed, meaning that no new observation and insights were emerging regarding awareness and climate change. This time period was selected to capture variations in climate experiences and perceptions over an extended time-frame, allowing for a comprehensive understanding of respondents' perspectives and behaviors related to climate change.

Sampling method

The snowball sampling method was used to recruit people for in-depth personal interviews. Informed consent was obtained from interviewees before starting the interview and participants were assured of the confidentiality and privacy of data as well as their safety.

Interview procedure

The in-person interviews were conducted using semi-structured format, allowing for flexibility while ensuring the not any important details are missed. These interviews took place in various settings depending on the preference and convenience of the respondent. The interview process started with obtaining informed consent from each respondent, ensuring they understood the purpose of the study, their rights as participants, and the confidentiality of their responses. Demographic details were captured on gender, age, education level and income. Respondents' age was captured into six age groups and six income groups were created to capture their income level. During the interview, the participants freely expressed

their experience, concerns and actions. Interviews covered environmental concerns, climate change understanding, information sources, effects and actions.

The subject matter of semi-structured interviews was based on people's environmental concern, climate change understanding, information sources, people's knowledge about causes and effects of climate change and the actions they take to minimize their contribution to the changing climate (Clifford and Travis, 2018; Huxster *et al.*, 2015).

Data analysis procedure

Qualitative data underwent analysis to unveil premises and themes highlighting disparities in participants' understanding of climate change. Content and thematic analyses were employed to comprehend their perceptions, environmental concerns, accountability and actions or intentions for climate adaptation. Both content analysis and thematic analysis were conducted to provide a comprehensive understanding of the qualitative data. content analysis was used to quantify the identified patterns and frequencies thematic analysis was used to explore the beliefs, attitudes, and perceptions, identifying predominant themes. The collected data were transcribed and scrutinized to gauge the depth of awareness and knowledge about climate change (Braun and Clarke, 2006; Berelson, 1952).

Interview data were meticulously transcribed, maintaining an exact record of spoken words. Content analysis organized responses, words and phrases to extract connotations or relationships. Key themes from the transcribed data were identified, categorized, coded and grouped – examining aspects such as climate change understanding and information sources. The coding process involved organizing responses, words, and phrases to extract connotations or relationships related to climate change understanding and information sources from the transcribed data. Quantification showcased the incidence of abstract ideas and themes, employing descriptive statistics and bar graphs to explore surface-level recurrence and frequency. Data were analyzed using descriptive statistics and bar-graphs.

Data analysis and discussion

The semi-structured interviews, involving 123 participants, reached saturation in responses regarding awareness and climate action. Demographics in Table A1 [1] reveal 54 males (44%) and 69 females (56%) from diverse backgrounds, averaging interviews in 69 min. Maximum responders are between 18 and 25 years of age. Participant education levels showed 31% post-graduates, 27% graduates and 26% 12th Pass.

Qualitative analysis

Familiarity with concept and idea of climate change. To start with, we asked the interviewees if they were familiar with the term climate change. Out of 123 total respondents, 120 of them were familiar with the term climate change. Three interviewees initially claimed unfamiliarity but in the detailed discussion it became evident that they did have an understanding of climate changes in terms of weather changes although they were not familiar with the specific term. This was probably because the term weather is used more commonly in everyday conversations, aligning with previous findings (Lang, 2014) and highlighting that while the term "climate change" may not be universally recognized, people have an awareness of changes in weather patterns. By synthesizing the interviews, it was observed that differences exist, in terms of knowledge, understanding and response to climate change, among age groups and education levels, but not significantly by gender. People recognize weather changes, though not universally as "climate change" (Moghariya and Smardon, 2014; Semenza *et al.*, 2008). Findings suggest varied familiarity by age and education, supported by existing research (Leiserowitz *et al.*, 2013).

Personal relevance and importance of climate change. To assess personal relevance, respondents were asked if they felt personally affected by climate change. Most affirmed, though some less educated individuals expressed uncertainty. Personal relevance motivates climate action (Semenza *et al.*, 2008) and is crucial for mitigation strategies (Scannell and Gifford, 2013; Bruine De Bruin *et al.*, 2021). Respondents, confirming the impact, also deemed climate change important. The higher personal risk perception correlates with support for mitigation policies, particularly among the more educated (Leiserowitz *et al.*, 2013). Personal relevance is a fundamental motivator for action (Stoll-Kleemann *et al.*, 2001).

Perspectives on addressing climate change. When asked about belief in the feasibility of addressing climate change, over half of the respondents expressed confidence in taking action. Variations in responses were observed across age groups and education levels, with the educated demographic exhibiting greater concern. Younger participants showed enthusiasm. Those acknowledging the potential for action were primarily graduates or individuals with higher education levels, emphasizing education's role in climate change awareness. Denial was prevalent among less educated individuals, consistent with prior research (Lee *et al.*, 2015; Moghariya and Smardon, 2014).

Responsibility for climate change. Surveyed on primary responsibility for addressing climate change, the majority cited individual responsibility, emphasizing personal acknowledgment. Others mentioned the government, environmental organizations and corporations. Less than 10% expressed uncertainty. Research indicates that those avoiding responsibility often engage in undesirable behavior (Chang *et al.*, 2016).

Effective approach against climate change impact. The interviewees were then asked to share their perspective on the most effective approach to tackle climate change. Respondents favored awareness and education as the most effective strategies, acknowledging its impact on pro-environmental behavior. Lifestyle changes, including reduced non-renewable energy consumption and sustainable consumption patterns, were also highlighted. This combination is seen as an effective approach to mitigating climate change (Manchanda, 2014; Steg and Gifford, 2017).

Action taken for climate change. On asking whether they have ever taken any action or is there anything that they regularly do that can be considered as pro-environmental or something that shows their concern for climate change, approximately 20% of interviewees reported taking actions to mitigate climate change. Despite recognizing its personal impact, many individuals do not translate this awareness into action (Maibach *et al.*, 2022; Schultz, 2014). Actions included water and electricity conservation, with potential barriers including lack of awareness and certain challenges (Maibach *et al.*, 2022). Emphasizing individual impact and implementing policies and programs may encourage pro-environmental behaviors (Schultz, 2014; Abdelwahed *et al.*, 2022).

Challenges to pro-environment behavior. To identify the barriers that prevent people from taking pro-environment actions, we asked interviews to describe the challenges or barriers that make it difficult for them or prevent them from engaging in pro-environmental behavior. Respondents cited unawareness, inconvenience, cost, discomfort and social pressure as barriers to pro-environmental behavior. Peer influence, lack of incentives and limited availability of eco-friendly products were mentioned as a barrier for pro-environment behavior (Abdelwahed *et al.*, 2022; Shi *et al.*, 2022; Van Der Werff *et al.*, 2021). Looking at various categories that have come up while evaluating the challenges that people face while engaging in pro-environment behavior, reflect that if people are pushed and are encouraged to adopt sustainable practices, they will continue with the climate action that they take. Nudging is one very important tool that can be used to influence people's behavior in a positive way (Czajkowski *et al.*, 2019; Lehner *et al.*, 2016). Nudging, considered a cost-effective tool, can positively influence behavior, complementing information-based approaches. The research suggests that nudges yield weak or mixed effects but it is a critical aspect to consider in the context of behavior change

interventions. Nudges have the potential to influence behavior on a subconscious level and do not require the extensive knowledge or awareness but they can be explored as a complementary tool to other strategies such as combining nudges with more information-based approaches (Hauser *et al.*, 2018; Schubert, 2017; Wee *et al.*, 2021). Economical alternatives and societal incentives were proposed to encourage environmentally friendly choices. Overall, overcoming challenges requires encouragement and a supportive social environment.

Quantitative analysis

Self-observation of climate change. When asked about personally observed evidence of changing weather conditions and climate shifts, interviewees unanimously reported experiencing various climate changes. These included extreme weather events, fluctuations in monsoons, prolonged dry periods, heavy rains in short spells, deadly heat waves, increased droughts and floods, cyclones, warmer winters, reduced snowfall and rising sea levels. The frequency of the self-observed changes in responses is shown in Figure A1 [1].

All the interviewees have observed that the weather conditions are more extreme nowadays. The responses seem to be influenced by the information received through different sources. Interviewees living on plains and talking about less snowfall and reducing snow cover; and interviewees living in drought prone area talking about floods reflect the influence of information from other sources such as television, newspaper, internet, etc. and also through informal or formal communication about climate change among friends, family and colleagues.

Their responses were a reflection of how differently people communicated in their own way and expressed their understanding of climate change by reflecting on various sources of knowledge and their own habits (Maibach *et al.*, 2022; Bruine De Bruin *et al.*, 2021).

Climate change information from external sources. Apart from self-observation, people also get information from various external sources like news and media, social media, government agencies, environmental organizations, workplace informal discussions, family and friends, non-government organizations, research and scientific studies.

Interviewees were asked to mention any three sources from where they received information about climate change. The information sources used by the interviewees are shown in Figure A2 [1]. The bar graph illustrates the responses regarding sources of information that people use. The three most cited sources are television (51.21%), educational institutions (45.54%) and non-governmental organizations. According to environmental communication theory, the information that is broadcast on television, media and other channels of communication does affect and shape people's understanding of climate change (Scannell and Gifford, 2013). This highlights the influence of mass media in shaping people's understanding of environmental issues.

Reliability of information sources. The reliability of information sources is important. When assessing the reliability of information sources, interviewees identified television and educational institutions as the most trustworthy. This is probably because television is the primary and regular source of information for people. People also ardently acknowledge and believe in the information received from educational institutions they affiliate. People tend to discard or disregard the information they receive from the sources they do not trust or they think are not reliable. The pie-chart in Figure A3 [1] demonstrates the preference for television (followed by newspapers) in terms of perceived reliability. This reveals the influence of mass media on shaping public perceptions of environmental issues. They also rely on information received from the internet or social media, environmental organizations, research journals and scientific studies.

Important environmental concerns. When asked about their top three environmental concerns, interviewees mentioned issues like air pollution (39.8%), deforestation (29.3%) and water scarcity (24.4%). Interestingly, only 14.6% cited climate change as a concern. The percentage of these issues is shown in Figure A4 [1]. Climate change was mentioned by only 14.6% of people as one of the environmental concerns.

The data analysis identified knowledge gaps and the need for capacity building to enhance climate change awareness. Findings from the present research show that people are observing changes in temperature and rainfall, but they need to understand their role in mitigating the impact of climate change and the benefits of adapting to climate change and awareness of climate change.

The concern about climate change has differed among different age groups. Middle-aged interviewees falling in the 35–44 age group have responded that to them, personally, climate change is a very important issue and they are very much concerned about its social, environmental and economic effects (Smith and Kingston, 2021). People who are either graduate or post graduate have expressed their concern toward climate change. Very few people who had no formal education have expressed that climate change is not at all important to them. This highlights that education plays an important role in enhancing people's capacity and understanding toward social issues and enhances the understanding of civic skills as a responsible citizen in particular. Research has shown that people who are more educated are more likely to be aware of environmental issues and their behavior confirms the fundamentals of sustainability.

The government can increase the quality of public transport in the city or encourage the use of electric vehicles in the city. Encouraging people to use public transport will not only address the problem of traffic and congestion on the roads of Gurugram but also reduce emissions and use of fossil fuels. Cycling and walking can be promoted by providing pavements for walkers and cyclists. It will not only address the issue of GHG emission, but also help in improving health (Bostrom *et al.*, 2019). Sincere actions are required to educate people about the causes and effects of climate change.

This initial premise, to measure the level of awareness and understanding of climate change among the residents of Gurugram, was formulated based on existing literature, outlining anticipated patterns of knowledge, attitudes and behaviors related to climate change. During the interviews and subsequent data analysis, the premise evolved as we found that participants had different levels of familiarity with climate change. The term "climate change" is not universally recognized, but people do have an awareness of changes in weather patterns and they consider climate change to be personally relevant and important. They recognized the need for action to address climate change, particularly those with higher levels of education. The profound influence of education was found on participants' responses as graduates and post-graduates consistently demonstrated a heightened concern for climate change. A notable shift from external agencies to individual agencies was observed in participants' perspectives on responsibility for addressing climate change. Television has emerged as the most common and trusted source of information about climate change, emphasizing its critical role in climate change communication.

Primary outcome of research

Over 90% of respondents were familiar with "climate change," though a few initially lacked awareness, later clarified as understanding weather pattern changes (Bruine De Bruin *et al.*, 2021). Most acknowledged personal impacts and expressed high concern, deeming them crucial (Spence *et al.*, 2012). Half believed in actionable responses, varying by age and education; higher education correlated with greater concern (Lubell *et al.*, 2007). Participants attributed primary responsibility to individuals, while some cited government, environmental groups and corporations (Stoll-Kleemann *et al.*, 2001).

Effective strategies include awareness, education and lifestyle changes (Wynes and Nicholas, 2017). Participants stressed reducing non-renewable energy consumption and adopting sustainable habits (Sobocińska, 2022). About 20% took concrete steps – conserving water and electricity and using energy-saving devices (Bichard and Kazmierczak, 2012).

Challenges included limited awareness, knowledge gaps, inconvenience, costs, habit discomfort and perceived lack of incentive (Fu *et al.*, 2017).

Implications

There is a need to bring out attitudinal and behavioral alterations in the outlook of people and create energy conscious citizens. Clear communication on the consequences of inaction is crucial (Leiserowitz *et al.*, 2013). Biodiversity loss and resource depletion challenge Gurugram's urban sustainability (Pramanik *et al.*, 2021). Policymakers must ensure sustainable development for Gurugram's future (Pramanik *et al.*, 2021). The current study has highlighted the limited awareness and understanding of climate change in Gurugram. Urgent government-led programs and workshops are needed for widespread awareness and capacity building. Policymakers should craft context-specific communication and engagement strategies. Targeted interventions should align with community needs, emphasizing climate education in school curricula. To have a sustainable future, Gurugram needs more programs like the Solar Water Heating Systems Program and the Integrated Watershed Management Program. Energy efficiency campaigns may be planned to sensitize people for energy conservation, use of renewable energy, climate change and sustainable development. This results is from author's interpretations and synthesis of the interview data, grounded in the evidence presented throughout the study. Increase in public transport to encourage the use of public transport (Chandel *et al.*, 2016).

Gurugram has an auto ancillary industry [2] where there is a potential of improving energy efficiency through heat recovery, which can contribute to both environmental sustainability and economic growth. The findings of the study will promote informed decision-making, pro-environmental behavior and community resilience.

Effective communication strategies to raise people regarding climate change along with people's observation of local patterns of climate change would enhance people's understanding of climate change.

Conclusion

The study is a primer on climate change understanding and awareness, revealing ambiguity in people's comprehension. People's expressions reflected ambiguity about climate change understanding, awareness of its urgency and resistance to adapting habits. The study exposes a lack of understanding and urgency, with most interviewees not taking sufficient measures [3]. Valuable insights into Gurugram residents' awareness and practices can inform effective policies. Recommendations include communication strategies through public education campaigns, workshops and training programs to enhance climate change education, which has been neglected. These recommendations are from the authors, based on analysis and synthesis of the interview data, and insights drawn from the perspectives and experiences shared by the interviewees. This would address economic, personal, social, methodical and radical aspects.

Policy measures and regulations are crucial for incentivizing sustainable practices in Gurugram. A participatory and affect-driven approach can align with the national 2030 agenda. The success of policy action depends on climate change awareness. Increased knowledge about the environmental impact of single-use plastic promotes consistent eco-friendly behavior by refraining from its use.

Limitations and future scope of study

Study limitations include self-reporting bias, city-specific findings and potential socio-economic bias due to the sampling method. Participants might have overestimated or underestimated

their knowledge and practices regarding climate change. The study is focused on Gurugram; therefore, the findings might not be applicable to cities with different geographical setups and different climatic conditions and difference in demographic features of the residents. The snowball sampling method used in this study might exhibit a potential bias toward people who share similar social characteristics, which could impact the generalizability of the findings to the broader population, particularly in terms of socio-economic status.

Future studies must control for variables influencing the correlation between education and climate concern. Insights can aid regions facing similar challenges. Comparative studies across geographical areas, longitudinal analyses and regional comparisons within India can enhance understanding.

Notes

1. Please see it on the Online Appendix.
2. The term "ancillary auto industry" refers to the sector that provides supporting products and services to the main automotive manufacturing industry. In Gurugram, this industry presents an opportunity to enhance energy efficiency and enhances environmental sustainability.
3. "Sufficient measures" refer to actions taken by individuals or entities to address climate change. In the study, the term "sufficient measures" was not predetermined with a rigid set of criteria. The participant-centric approach was followed, allowing interviewees to define what they considered adequate actions to address climate change based on their own perspectives and understanding. The open-ended questions were employed, encouraging interviewees to share their thoughts on what actions, initiatives, or changes they believed would effectively contribute to addressing climate change in their context. The lack of understanding and urgency, as mentioned in the study, emerged from the participants' responses and perceptions of climate change-related actions. I acknowledge that this approach introduces a level of subjectivity, but it allows for better understanding of diverse perspectives on the matter.

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Supplementary material
The supplementary material for this article can be found online.

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