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at

The Energy Resource Institute

"Assessing knowledge, awareness and attitude towards climate change"

by

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PG/20/090

Under the guidance of

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms Supriya Sarkar has been associated with us as a trainee from 11/04/2022 to 30/06/2022. During the period she has been working on "Understanding climate change and health association in India (UCHAI Project)" with the Environment and Health Area of the Environment & Waste Management Division and also has successfully completed her project on “Assessing knowledge, awareness and attitude towards climate change.”

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This is to certify that **Supriya Sarkar** student of PGDM (Hospital & Health Management) from the International Institute of Health Management Research, New Delhi has undergone internship training at **The Energy and Resource Institute** from 11/04/2022 to 30/06/2022.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

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CERTIFICATE OF APPROVAL

The following dissertation titled **"ASSESSING KNOWLEDGE, AWARENESS AND ATTITUDE TOWARDS CLIMATE CHANGE"** at **"THE ENERGY RESOURCE INSTITUTE"** is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **PGDM (Hospital & Health Management)** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted. Dissertation Examination Committee for evaluation of the dissertation.

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CERTIFICATE FROM DISSERTATION ADVISORY COMMITTEE

This is to certify that **Ms. Supriya Sarkar,** a graduate student of the **PGDM (Hospital & Health Management)** has worked under our guidance and supervision. She is submitting this dissertation titled "**ASSESSING KNOWLEDGE, AWARENESS AND ATTITUDE TOWARDS CLIMATE CHANGE**" at "**THE ENERGY AND RESOURCE INSTITUTE**" in partial fulfillment of the requirements for the award of the **PGDM (Hospital & Health Management).**

This dissertation has the requisite standard and to the best of our knowledge, no part of it has been reproduced from any other dissertation, monograph, report or book.

Dr. Vinay Tripathi	Ms. Vidhu Gupta
Associate Professor	Associate Fellow
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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "**Assessing knowledge, awareness and attitude towards climate change"** and submitted by **Supriya Sarkar, PG/20/090** under the supervision of **Dr. Vinay Tripathi** for the award of PGDM (Hospital & Health Management) of the Institute carried out during the period from 11/04/2022 to 30/06/2022 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

FEEDBACK FORM

Name of the Student: Supriya Sarkar

Name of the Organisation: The Energy and Resource Institute (TERI)

Area of Dissertation: Environment and Health

Attendance: 100%

Objectives achieved:

- Identification of adaptation and mitigation measures for climate change impacts on human health
- Drafting the climate-sensitive diseases action plan for the state of Uttarakhand
- Developing google form questionnaire for medical officers
- Drafting a governance document
- Follow up with participants of an NGO survey

Deliverables:

- Drafted a document on adaptation and mitigation measures for climate change impacts on human health
- Prepared a draft of the climate-sensitive diseases action plan
- Developed a google form for the questionnaire for medical officers asking about climate change and human health
- Prepared a draft of the governance document, being reviewed by the committee and under revisions
- Supported in getting responses from the NGO participants

Strengths: Literature review, sincerity

Suggestions for Improvement: Writing skills, summarizing the findings

Suggestions for Institute (course curriculum, industry interaction, placement, alumni)

Signature of the Organisation Mentor (Dissertation)

Date: July 1, 2022

Place: New Delhi

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

AIIMS - All India Institute of Medical Sciences

CC - Climate Change

CSDs – Climate Sensitive Diseases

DCB - Domain-Context-Behaviour

GCC – Global Climate Change

GHG – Greenhouse Gas

HKH - Hindu Kush Himalayas

ICMR - Indian Council of Medical Research

IMS - Indian Meteorological Society

IIPA - Indian Institute of Public Administration

IPCC - Intergovernmental Panel on Climate Change

IIHMR-D - International Institute of Health Management, Delhi

IIT-D – Indian Institute of Technology, Delhi

NIMR - National Institute of Malaria Research

NAPCC -National Action Plan on Climate Change

NHSRC - National Health System Resource Center

NIUA - National Institute of Urban Affairs

NVBDCP - National Vector Borne Disease Control Program

SPSS – Statistical Package for Social Sciences

SST - Sea Surface Temperature

TARU – Technical Assistance Research Unit

TERI - The Energy and Resource Institute

UHC - Universal Health Coverage

UCHAI - Understanding Climate Change and Health Associations in India

WHO – World Health Organization

CHAPTER 1 - DISSERTATION REPORT

1.1 About the Organization

The Energy and Resource Institute (TERI) was set up in Darbari Seth Block, which was named after its founder Mr. Darbari S Seth and Dr. R K Pachauri in 1993. Its permanent base is in the Indian habitat centre complex, Lodhi Road, New Delhi. TERI is a research institute that specializes in conducting research for sustainable development. This center provides information on energy issues. The institute has made a lasting and significant impact on policy and technology solutions over the years, benefiting people and the environment.

Indian Habitat Centre, Lodhi Road, New Delhi

It is an independent, multifaceted organization with expertise in policy, researches, consulting, and implementation. The debate about environmental change, climate change, and sustainability was pioneered by innovators and change agents over four decades. The institute believes that waste

management and resource efficiency are the foundations of clever and sustainable development. The workspaces include:

- Proper use of resources
- Relying more on sustainable practices
- Environment and climate

Both business and communities have undergone radical change as a result of the research-based solutions. Establishing forums, it has promoted global cooperation on sustainability-related initiatives. It is accomplished through converting the research into technological goods and services as well as policy consultation and outreach.

Other regional offices and campuses are in Gurugram, Bengaluru, Guwahati, Mumbai, Panaji, and Nainital in addition to the headquarters in New Delhi. With the help of more than 750 scientists, sociologists, economists, and engineers, breakthrough research and solutions are produced.

Mission

TERI's mission is to promote efficient usage of energy by innovative ways for cleaner and sustainable development.

Goals

- Pathways for renewable energy
- Universal access to clean energy
- Improved use of iron and cement
- Better utilization and access to water, including watershed management
- Increased energy efficiency in businesses, public utilities, and buildings

- To improve the ability of a community to withstand the negative effects of climate change due to variation in temperature and cyclones.
- To combat pollution through innovative policies
- Improving ecosystem services in forestry
- Enabling sustainable food production
- Enabling green and sustainable buildings, management of sewage, solid waste, sanitation, and quality of air.

Methods

- Interdisciplinary studies and evaluations
- Making decisions based on facts and data; pilot tests that go from the lab to the field; and
- Business model validation
- Improving livelihood with new techniques and technology
- Policy consulting and advice
- Outreach and education to change consumer and decision-making behavior
- Increasing capacity
- Cooperation among parties, both domestically and abroad.

Promise

- Upping the use of sustainable inputs
- Aiming to increase resource efficiency
- Minimizing negative effects on the environment and the climate
- Expanding access to essential services
- Scaling up and promoting the use of waste management and resource-efficient solutions

1.2. TERI and climate change

To allow policies and practices for a sustainable future via efficient use of energy and conservation of resources, the aim is to serve as innovators and agents of change. These are the objectives:

- Increasing everyone's access to clean energy and developing renewable energy sources
- Improve the energy efficiency of buildings, public utilities, and industry.
- Better utilization of resources including iron, steel, and cement
- Facilitate dependable nutrition and sustainable food production
- Improve ecosystem services, particularly those related to forestry and biodiversity
- Improve water access, use, and conservation, including watershed management
- Create cutting-edge strategies for improving city air quality.
- Facilitate the design and administration of environmentally sound cities by encouraging the use of green structures and improving sanitation and quality of air.
- To increase resilience to the impact of climate change due to variation in temperature and cyclones.
- Quicken the reduction of pollution through creative policies and environmental products
- Create methods for producing advanced biofuels and bio-products with added value

Strategies

- Policy advice: interdisciplinary research and analysis, business model development and outreach, capacity building for decision-makers, and financing.
- Technology products: Creation of the technology, demonstration through pilot tests, mass production, commercialization, as well as the development of manufacturing and operating capacity

- Technical services, including consulting, testing, and verification, as well as strategy creation and stakeholder capacity building.

1.3. Understanding Climate Change and Health Associations in India (UCHAI)

With assistance from the National Institute of Environmental Health Sciences, TARU Leading Edge, and Indian Meteorological Society, "Understanding Climate and Health Associations in India (UCHAI)" was launched in September 2015 as an open network to connect experts, professionals, organizations, to address climate change and health issues in India. It is an effort to increase India's capacity for climate-proofing human health.

The UCHAI Advisory Committee, which is made up of professionals from prestigious Indian universities including the All India Institute of Medical Sciences (AIIMS) and the National Health System Resource Center (NHSRC), International Institute of Health Management (IIHMR-Delhi), National Institute of Malaria Research (NIMR-ICMR), Indian Institute of Technology, Delhi (IIT-D), Indian Institute of Public Administration (IIPA), TARU, The Energy and Resources Institute (TERI) and National Institute of Urban Affairs (NIUA). The initiative is hosted by TERI/IIHMR-D and is being supported by the National Institute of Environmental Health Sciences, National Institutes of Health, United States. These partnerships help broaden the horizon of engagement and encourage understanding of linkages between climate change, sustainable development and effects on human health across disciplines. To meet this purpose several activities have been carried out in partnership with the Indian Meteorological Society (IMS).

In addition to the UCHAI Advisory Committee, there is a functional community of practice group connected through various social media. To support this, a knowledge and partnership platform

has also been created though dedicated website www.uchai.net, developed & maintained by TARU Leading edge. The website has features of blogs, mentors, and various knowledge building activities which consists of workshops, webinars, infographics, e-trainings, publications, and presentations.

Vision

Building capability for India's health industry to be climate-proof

UCHAI Activities-

UCHAI as a network evolved and has demonstrated commendable partnership spirit to support the climate and health initiatives in India. UCHAI network has worked well as a group in organizing technical meetings, promoting partnerships, developing joint concepts and proposals, sharing knowledge, and expanding reach by enlisting new members. Some of the activities undertaken by the network are in Research, conducting Workshops and webinars, Training and E-trainings, Policy Engagement, Partnerships and Networking.

1.4. Observational learning

- Brief discussion on the purpose of the **'UCHAI Project'** and also on the adaptation and mitigation technologies which could be used in the interventions of climate change.
- It also gave an insight on the mitigation and adaptation measures specific to various CSDs such as vector- borne diseases, water- borne diseases, extreme climate events, heat waves etc.
- Discussion on the climate sensitive disease action plan in Uttarakhand which emphasized on the actions plan, strategies and intervention.
- Development of the questionnaire on Health Adaptation Plans and Vulnerability Assessment for Medical officer.
- Drafted the governance document of 'UCHAI project' which comprises the network strategy plan.
- Conducted a follow up study which aimed to understand the efforts of non- governmental organizations towards building resilience for health and climate change issues.
- The study purpose is in exploring the efforts taken by various institutions like industries dealing in climate change, environment, public policy, research, health care; non-governmental organizations, corporates and universities to face the challenge of climate change and human health.
- Feedback and follow ups taken as a part of the study.

CHAPTER 2 - PROJECT REPORT

2.1. ABSTRACT

Climate change is the biggest challenge facing humanity and the environment. Human health is already being impacted by climate change in a variety of ways. For the current trends in global climate change, human behaviors, through activities that have increased the release of GHGs like carbon dioxide and methane. Adoption of behavioral solutions on a large scale could reduce emissions and improve the likelihood of keeping global temperatures far below 2ºC.

People's knowledge, awareness and attitudes regarding climate change are essential to slow down climate change. It is a cross-sectional descriptive study that collected responses from 150 people. A questionnaire of 24 closed-ended questions was administered online. According to the results, most people were enough knowledgeable about climate change and its outcomes. 39.3% believed that individual should take responsibility. 50.7% of participants are most willing to pay more for energy produced from renewable sources of energy, mostly agreed to educate themselves about climate change (80%), support climate change awareness campaigns (74%) and advocate for climate change adaptation (50.7%), when it comes to activities that can mitigate climate change (42.7 percent). People's awareness and attitude play an important role in reducing emission, asking questions about policies, being part of environmental programs and in designing intervention according to them.

Keywords: *awareness, attitude, climate change, greenhouse gas, knowledge, human health,*

2.2. INTRODUCTION

Climatic change is the change in the temperature and weather patterns. It is the biggest threat to humanity, causing environmental and health problems. Greenhouses gases get trapped in the atmosphere of earth, causing its temperature to rise. The change in climate affects the social determinants of health like drinking water, air, shelter, and supply of food and has the potential to undo the progress in health over decades.

Global heating of earth is increasing the temperature of the earth over the past few years and it is impacting the health of humans in many ways. It is causing death and illness. Conditions like drought, flood, heat waves, sudden change in weather pattern is arising. Climate change is not only causing the physical change but also causing mental illness. Human activities have contributed as the main factor for the climate to change rapidly. Not only the environment is affected but it also affects the people, animals and plants who depend on it.

The WHO estimates that between 2030 and 2050, climate change will result in an additional 2,50,000 deaths year from climate-sensitive hazards like malaria, diarrhea, heat stress and also from starvation By 2030, the cost to health is expected to be between US$2- 4 billion annually. Developing countries would be the most affected and will not be able to manage without support to plan and respond due limited health infrastructure.

The mining and burning of fossil fuels emits greenhouse gases, which play a significant role in both air pollution and climate change. Individual decisions about transportation, diet, and energy consumption have the potential to minimize greenhouse gas emissions and have significant positive effects on one's health, notably by reducing air pollution. Adaptation strategies, such

encouraging use of public transit and physical activity, could reduce ambient air pollution and carbon emissions, which are responsible for 7 million preventable deaths annually.

2.2.1. Climate change- the biggest challenge for humanity

The greatest threat to human health is climate change, and medical professionals are already taking action to mitigate its negative effects on health due to climate change around the world.

The repercussions of climate change are now more widespread and severe than anticipated, according to the sixth assessment report of the Intergovernmental Panel on Climate Change (IPCC). With just 1.1 degrees of warming, climate change is already creating significant disruption in every corner of the globe. The IPCC report is made up of three Working Group Assessment Reports—Working Group I, Working Group II and Working Group III which brief about adaptation, mitigation, vulnerability of Climate Change. According to the IPCC, climate change will cause 32–132 million extra people to live in extreme poverty during the next ten years. Food security will be compromised by global warming, which will also make heat-related deaths, heart disease, and problems with mental health more common. Currently, 3.3–3.6 billion people reside in nations that are extremely sensitive due to the effects of climate change. Global hotspots are primarily found in emerging nations, the Arctic, South Asia, Central and South America, and a large portion of sub-Saharan Africa. Between 2010 and 2020, the fatality rate from droughts, storms, and floods was 15 times higher in countries with high risk than it was in those with low vulnerability.

No one is immune to these risks, but those who contribute the least to the climate problem are the ones who are most negatively impacted in terms of their health.

The recent advancements in development, global health, and poverty reduction are in danger of being undone by the climate crisis, which also has the potential to exacerbate already-existing health disparities amongst people. It seriously jeopardizes the attainment of universal health coverage (UHC) in many ways, including by increasing the disease burden already present and escalating current barriers to obtaining health services. Around 12 percent of the world's population, or approximately 930 million individuals, spend at least 10% of their income on health care. Health shocks and pressures are already a burden for the poorest people, and the effects of climate change are making this trend worse.

2.2.2. Climate and human health

Health is already being impacted by climate change in a variety of ways, which include increase in the frequent extreme weather events like heatwaves, floods, tsunamis, storms. Climate change also has caused in an increase in water, food, vector-borne diseases, respiratory illnesses, and mental illness. In addition, many of the social factors such as access to basic healthcare, and livelihoods, are also being weakened by climate change. The most vulnerable and disadvantaged people are disproportionately affected by these climate-sensitive health concerns.

Although it is clear that climate change has an influence on human health, it is still difficult to predict severity of many climate-sensitive health hazards. But as science progresses, we can increasingly link mortality to human-caused global warming and more precisely assess the severity of these health problems.

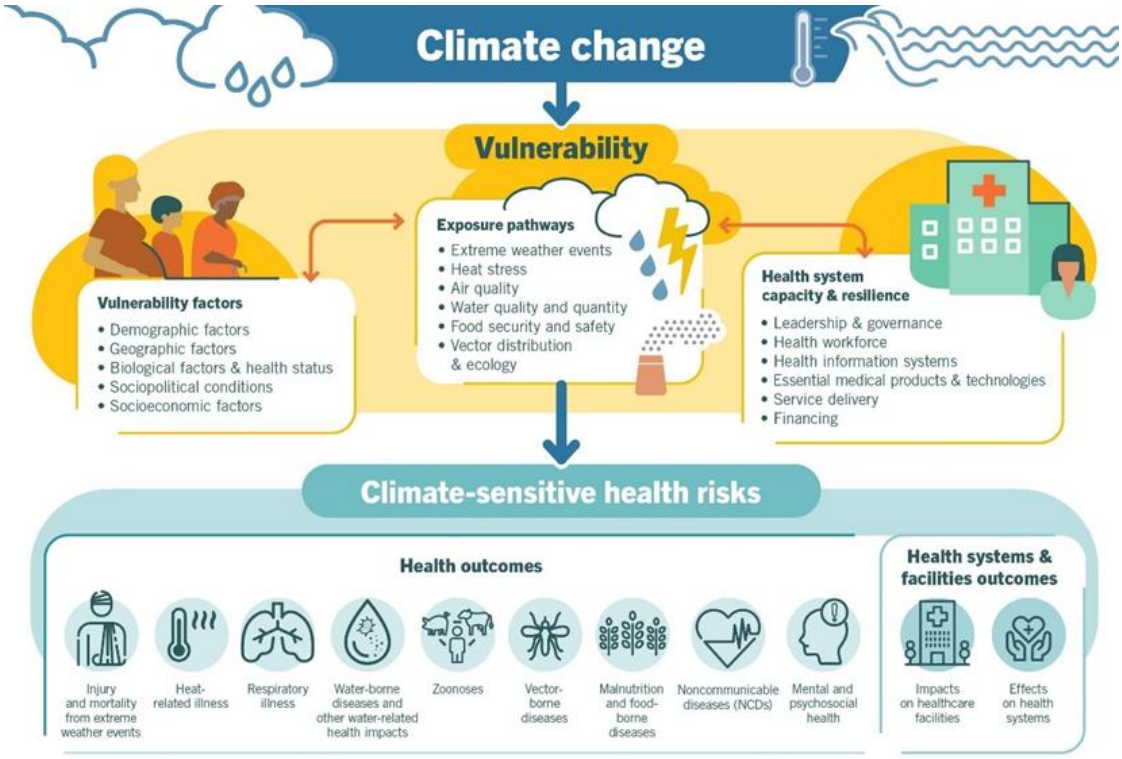

Figure 1: climate-sensitive health risks, Source: WHO

The susceptibility of populations, their resilience to climate change, and the pace of adaptation will all play a significant role in determining the health implications of climate change in the short- to medium-term. Longer-term outcomes will depend more and more on the degree to which transformative action is done today to decrease emissions and prevent the breaching of hazardous temperature thresholds.

2.2.3. Climate change in India

In India, the average temperature increased by about 0.7°C between 1901 and 2018. GHG-induced warming is mostly to blame for this temperature increase. The temperatures of the warmest day has increased by 0.63°C and for coldest night by 0.4°C. By the end of the twenty-first century, it

is predicted that the frequency of summer heat waves across India (April to June) will have increased by three to four times.

Between 1951 and 2015, sea surface temperature (SST) in the tropical Indian Ocean has increased by 1°C and summer monsoon precipitation (June to September) has decreased by 6% .

Between 1951 and 2014, the Hindu Kush Himalayas (HKH) had an increase in temperature of roughly 1.3°C. In recent decades, the amount of snowfall in certain parts of HKH has decreased, and glaciers have also begun to recede. The high-elevation Karakoram Himalayas, in contrast, have seen more winter snowfall, protecting the area from glacier retreat.

Numerous natural and man-made health stressors, including climate change (CC), have posed a threat to human health and wellbeing. A few of these health effects are already being felt nationwide. The frequency, severity, length, and locations of weather and climate events, such as temperature increases, heavy rains and droughts, and various other types of extreme weather, are all changing in tandem with the changing climate. As a result, regions already affected by weather and climatic phenomena that pose a hazard to human health, such as heat waves, hurricanes, are likely to see worsening effects, including temperature rise and an increase intensity of storm, rainfall. Additionally, it implies that some regions would face fresh health risks brought on by the climate. The timing of the seasons that offer the greatest risk to human health could change even in regions that now experience these health hazards. Therefore, climate change have a negative impact on human health by altering the severity or frequency of health issues already impacted by climatic or meteorological factors; and also, by posing new, unexpected health risks in areas where they have never existed before. Warming of the atmosphere and evidence from observations show that severe temperature and rainfall events are getting more frequent. There are several examples of human related adverse effects of enhanced temperature and extreme weather events.

India is not exempt from the health risks associated with global warming, such as air pollution illnesses, vector-borne infections, heat stress and water-related epidemics.

India had established a National Action Plan on Climate Change (NAPCC) in 2008 to put its programmes, policies, and strategy for addressing the problems caused by climate change. Eight national missions were outlined by the NAPCC.

i. National Solar Mission

ii. National Mission for Enhanced Energy Efficiency

iii. National Mission on Sustainable Habitat

iv. National Green India Mission

v. National Water Mission

vi. National Mission on Sustainable Agriculture

vii. National Mission for Sustaining the Himalayan Ecosystem

viii. National Mission on Strategic Knowledge for Climate Change

In order to develop methods for minimizing, controlling, and managing the impact of climate change on health, India has developed "Health Mission" within the purview of NAPCC. The mission aims to analyze epidemiological data, identify populations and places that are vulnerable, generate knowledge and expertise, raise awareness, and encourage community involvement. In addition to the overall public health infrastructure at the national and subnational levels, the Government of India has started programmes like the National Vector Borne Disease Control Program (NVBDCP) and the Integrated Disease Surveillance Program (IDSP) to combat vector

borne illnesses like malaria and dengue. India hopes to eradicate malaria as part of its effort by 2030..

2.3. RATIONALE

For the current trends in global climate change, human behaviors, through activities that have increased the release of GHGs like carbon dioxide and methane, are mostly to blame. Environmentally illogical actions and decisions have received media attention and advertising campaigns.

It will take a lot of effort to keep global temperature fluctuations within reasonable bounds during this century in order to mitigate the worst climate impacts. This in turn depends on humankind's ability to minimize greenhouse gas emissions quickly and sustainably. To accomplish this, we must restructure our economy, consumption and systems of production and as well as how we create and consume food, energy, and other resources. Changes at the level of individuals and communities are of a far higher importance than most people realize, despite the fact that the focus of most of this change frequently lies at the size of government and industry.

Individuals frequently express feeling helpless to make a difference on a large enough scale to matter for something as serious as climate change. However, when adopted by billions of individuals, little changes in individual behavior have a significant influence. The consumption of natural resources by humans accounts for over two-thirds of world emissions, and even conservative estimates for the capacity to change behavior to reduce resource consumption would significantly cut global emissions. However, achieving this potential is a difficult task. It necessitates developing creative strategies for involving people, homes, and communities as well as altering deeply rooted production and consumption practices. The fight against climate change

solutions which has to taken are global policy reform, information-based messaging and financial incentives.

With the knowledge, attitudes, commitments, motives, technologies, and tactics required to address environmental issues, education about sustainability tries to change people's beliefs. According to studies, undergraduate and high school students' views toward sustainable consumption can be influenced, and the demand for consumption-related lifestyle modifications can be increased. When developing culturally sensitive interventions and policies to reduce climate impact, taking into account these contexts can be crucial. Hope for changing unsustainable patterns toward the environment can come from human conduct. Adoption of behavioral solutions on a large scale could reduce emissions and improve the likelihood of keeping global temperatures far below 2ºC.

The survey's findings will give us information about how the general public feels about climate change, their knowledge and awareness. The study will also reveal people's attitudes regarding changing their behavior to be more environmentally friendly. And altering current consumption and behavior patterns is essential to halting or slowing climate change.

2.4. OBJECTIVES

The study would help in understanding the state and awareness of the people. It would help to assess the association of human behavior and climate change.

The Objective of the study is:

- To assess the knowledge and awareness of people towards climate change.
- To understand their attitude towards making adaptive changes to mitigate climate change.

2.5. REVIEW OF LITERATURE

- Another study took into account two ways that a rise in climate change knowledge could spur change: (a) directly by influencing people's behavior to make more environmentally friendly purchasing decisions, and (b) indirectly by putting pressure on the political system. The findings, which were taken into account for the three consumption sectors of housing, food consumption, and mobility. The study reveals the persistence of an attitude-behavior difference. The findings demonstrate how the public and political discourse on climate change has changed as a result of the rise in climate change awareness. (Sandra Venghaus, Meike Henseleit and Maria Belka, February 2022)

- This study intended to explore the influence of attitudes towards CC and chosen sociodemographic characteristics to explain Schwartz's motivational human values. A 1270-person sample size was evaluated. Less than half of those who support CC believe it is fully manmade. It was discovered that the relationship between CC concern and education helps to explain 11.8 percent of the conservation variance, the relationship between CC concern and gender helps to explain 10.1 percent of the self-transcendence variance, and the relationship between CC concern and age helps to explain 13 percent of the openness to change variance. This study highlights the primary human values that influence attitudes toward CC. (Narcisa Maria Oliveira Carvalho Dias, Diogo Guedes Vidal, Hélder Fernando Pedrosa e Sousa et. al, 19 November 2020)

- In order to evaluate the relationship between students' views and intentions for pro-environment behavior with respect to global climate change, a model was built in a study. Data on personality traits and related latent variables of environmental attitude, including

sustainability value, social norms, environmental concern, and perceived risk, were gathered from 275 undergraduate students for the research model. Personality factors tempered the effect of undergraduate students' environmental attitudes. The results of this study give firms and policy makers better insights into undergraduate students' views and behavioral intentions toward GCC and raise awareness of this issue. (Tai-Yi Yu and Tai-Kuei Yu, November, 2017)

- A cross-sectional survey was conducted among 6720 households in 224 rural villages in seven Bangladeshi districts that were considered vulnerable, with a total population of 19,228,598. 30 households were chosen randomly from each enumeration area (BBS). A standardised questionnaire was used to gather data from all 6720 research participants. Only 9.6 percent of those surveyed had a college degree or higher; mostly were farmers or day labourers (60 percent). 54.2 percent of the participants had little knowledge about CC, compared to 45.8 percent who did not (p 0.001); The vast majority of informed participants (n = 3645) perceived high temperatures as a shift in the climate (83.2 percent). 94.5 percent of the responders (n = 6720) thought the climate has changed. The majority of them (91.9%) saw changes in rainfall patterns over the past ten years, and 97.8% of respondents believe that the extreme weather events have increased the cost of their health care. The study group's level of CC knowledge was ordinary, but there was a high level of awareness of CC-related events and their effects on health. Education was the main component that contributed to the understanding of CC and its effects on health. (Md Iqbal Kabir, Md Bayzidur Rahman, Wayne Smith et. al, March 2016)

- A total of 210 students from the different courses of Isabela State University participated in this study. The study employed a conventional questionnaire. Descriptive statistics like frequency and percentage were used to analyze the data. Students showed high levels of knowledge, attitude, and perception with respect to climate change, according to data analysis.

It was discovered, however, that there are no appreciable differences between students' awareness, perceptions and attitude of climate change when they are grouped according to age, religion. Additionally, there is a substantial association between students' attitudes and perceptions of climate change, but there is no significant relationship between perceptions of the students and their knowledge. (ChangeLorelei C. Tabago, January 2016))

- This study looked into the beliefs, behaviors, and practices of 1,103 seniors in high school on climate change. The study also looked at how students' knowledge, attitudes, and practises were affected by their age, gender, religion, subject affiliation, and parents' educational levels. Data collection involved the use of a questionnaire. The results showed that while students' attitudes toward climate change issues are somewhat favourable, their knowledge of these issues is slightly low. They participate in activities that partially expose the environment to negative effects, like flooding. It appears that other independent variables, excluding gender, do not significantly differentiate students' knowledge, but mothers' educational attainment has an impact on student behaviour. (Folajogun V. Falaye & Eugenia A. Okwilagwe, 2016)

- A cross sectional study conducted among students of Ramnagar Belagavi city, evaluates attitudes and knowledge of global warming. 400 students from three different medium schools participated in the study utilizing a pretested, self-administered questionnaire. Only 16.5 percent of the pupils in this research had high understanding of global warming, the majority had moderate awareness (70.5 percent), and 13 percent had poor knowledge of the issue. The majority of students (78.5%) had an average attitude regarding global warming, whereas only 21.5% had an unfavourable attitude. Age, sex, class/grade, and different schooling medium all significantly affected knowledge and attitude, however neither place of residence nor religion

showed any discernible influence. (Jitendra Kumar Sah, Asha Anil Bellad, Mubashir Angolkar, 2015)

- In three causal steps, the domain-context-behavior (DCB) model presented the social-psychological drivers of a wide range of climate change mitigation behaviors. Particularly, it is believed that the emergence of widespread pro-environmental and pro-biospheric value orientations is where psychological motives begin (i.e. the domain). The model is then examined and verified using a representative national sample of the UK population. In wave 1 (N = 808), the model constructs were reviewed, and in wave 2 (N = 501), self-reported behavior was collected. Overall, 35% of the variance in aggregate mitigation behavior, 57% of the variance in specific mitigation intents, and 66% of the variance in overall mitigation intentions. There are significant discrepancies between the factors that determine high-co and low-cost, low-impact behavioral changes. (van der Linden, S., 2014)

- It was an online poll conducted in The Republic of Macedonia with the goal of discovering the main drivers of environmental and climate-conscious behaviour as well as their obstacles. Social media sites like Facebook and Twitter were used to spread the word about the online survey. 473 people took part in the survey. According to the survey, Macedonians consider the environment while making daily decisions like choosing alternate forms of transportation and conserving electricity and water. But long-term choices, like installing renewable energy equipment and getting a fuel-efficient car, they are less thoughtful. However, a belief that it is not the responsibility of individuals, but rather of the government, industries, and businesses. 85% of respondents are willing to pay more for electricity produced from low-carbon or renewable resources. For 70% of participants, the Internet as a whole, for 42% on social media, and for 30% on specialised Internet portals, is a key source of knowledge about climate change.

However, traditional media, especially television, is still widely used by Macedonians, and 61 percent of survey participants said they got their information from it. (Dr Dragana Bojovic, Ars Locus DOOEL, December 2014)

2.6. METHODOLOGY

It is a cross-sectional descriptive study where purposive sampling technique is used to collect responses from 150 people. The medium of the questionnaire was in English language. There were 24 closed-ended questions in it. The questionnaire asked participants to provide sociodemographic data and details about themselves, such as their age, gender, level of education, and line of work. The section also asks participants on their acquaintance with activities related to climate change and how the environment has changed over the last ten years. It also included questions that looked at behavioral factors, including whether individuals had taken the environment and climate change into account when making daily decisions and the motivations for those considerations. It gathered information on the participants' degree of awareness of climate change, their perceptions of a potential increase in climate change-related media issues, and their acquaintance with institutions and public awareness initiatives.

The majority of the questions were of the multiple-response variety, and several of them had areas for extra options. Participants have the chance to add additional comments about climate change in the last question. The questionnaire was distributed through social media platforms, LinkedIn and also in the known circle and people were asked to circulate further. The participants gave their consent before participating in the study and who did not provide consent were excluded. Data analysis was done using SPSS and on google form.

2.7. RESULTS

2.7.1 Demographic details-

The results of this survey were based on 150 responses received in two weeks. Participants who responded in the survey belonged from different professions like Teachers, Health professionals, Bankers, Nutritionist, Architects, House makers, Students and much more.

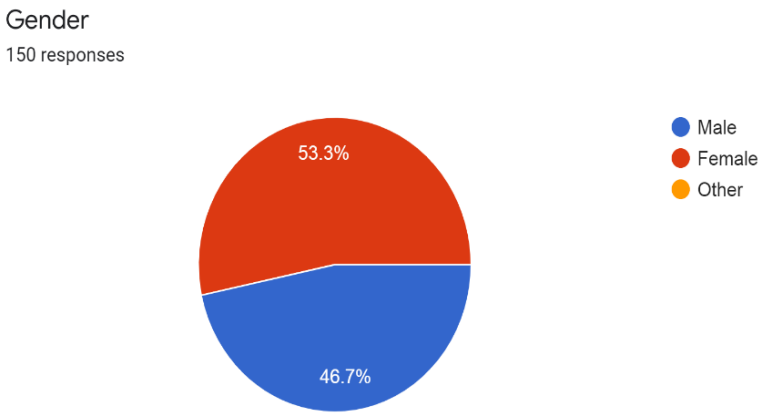

Figure 2- Gender-wise percentage

The above figure shows participants' gender distribution, out of which 53.3% were females and 46.7% are males. The age groups who took up the survey ranged from 18-56, where major responses were received from age '24'; which comprised 16% of the total respondents.

Out of all the 150 participants, 52.7% were graduates, followed by 31.3% postgraduates, 13.3% who had done their schooling and rest 2.7% opted ‘other’ as their response.

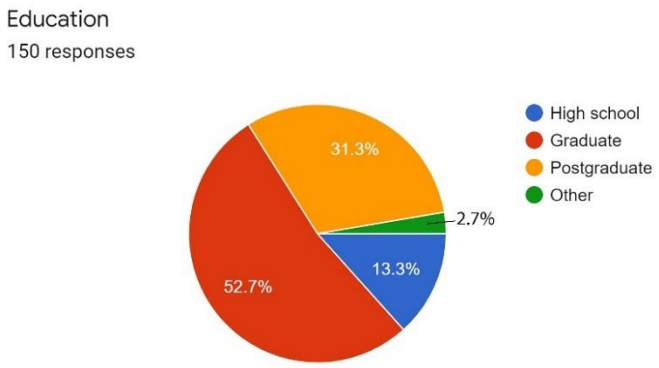

Figure 3 - Education wise percentage

2.7.2 Knowledge, awareness and attitude analysis-

This question tried to capture the kind of climate change pattern observed by the respondents in past 10 years. It was a multiple-choice question where respondents were allowed to select multiple option. 90.7% respondents noticed rise in the temperature, the intensity and frequency of extreme weather occurrences, like as heat waves, have grown, according to 64%. Graph below shows the percentage of different events in the environment.

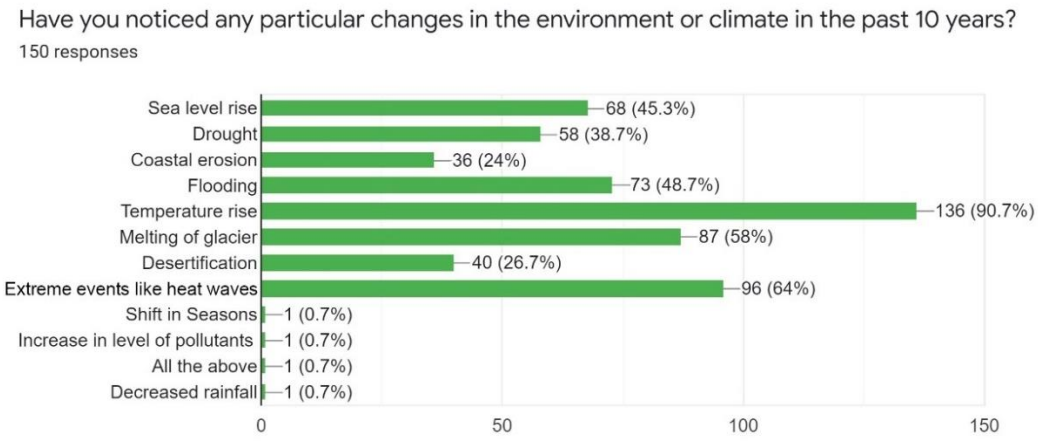

Figure 4 - Changes observed in environment by respondents

91.3% of the respondents believe that the weather pattern is changing, rest 5.3% of the people were not sure and 3.3% thought that it's not changing.

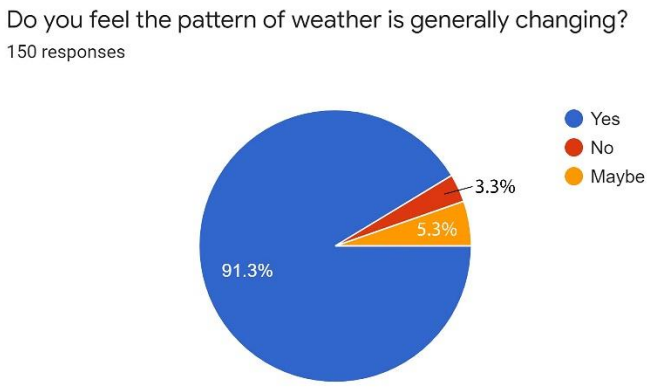

Figure 5 - weather pattern changes

This question tried to assess the definition of climate change to different people. It included change in temperature, environment, weather condition, change in climate due to human pollution and due to global warming. Majority answered all of the above as their answers.

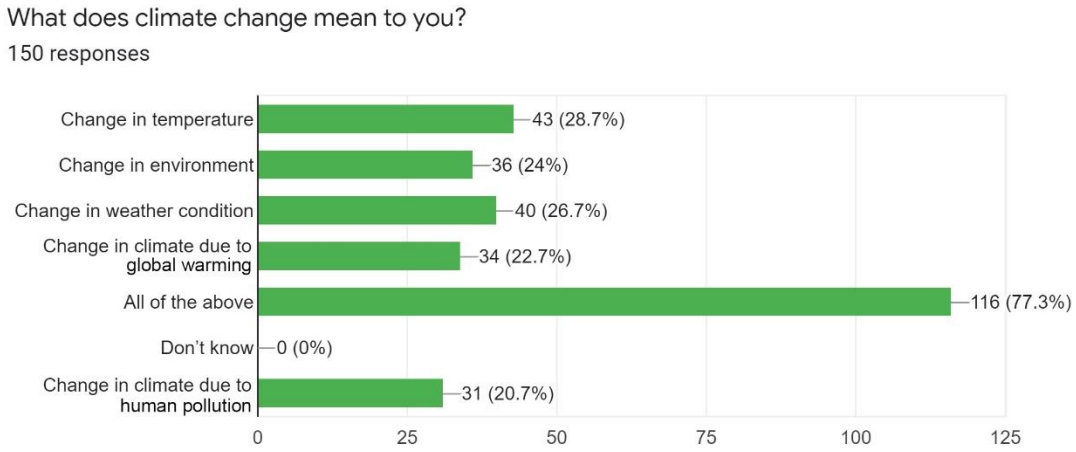

Figure 6- Climate change definition

96% of the participants believed that human activity is responsible for climate change. 5.3% said may be and 3.3% disagreed.

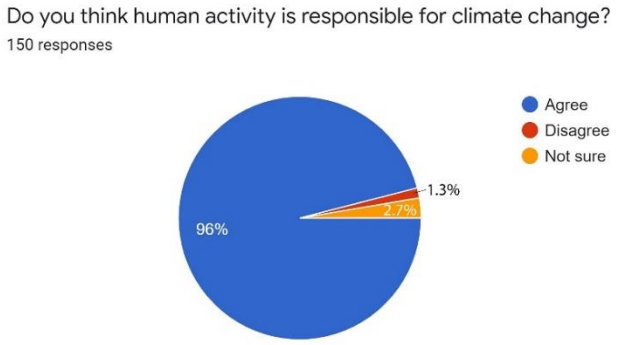

Figure 7- Human activity responsible for climate change

To assess whether climate change has an impact on health, a general question regarding health affected by climate was asked. 76% thought that climate has affected their health, 17.3% were not sure and rest 6.7% of them said no.

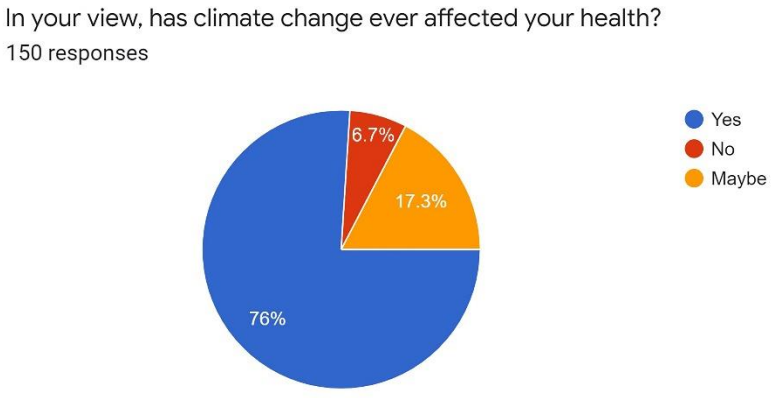

Figure 8- Climate change and health

Different type of climate sensitive hazards observed by the respondents are shown in the graph below. Out of which heat waves, extreme weather related and respiratory were the three top climate sensitive hazards according to the participants.

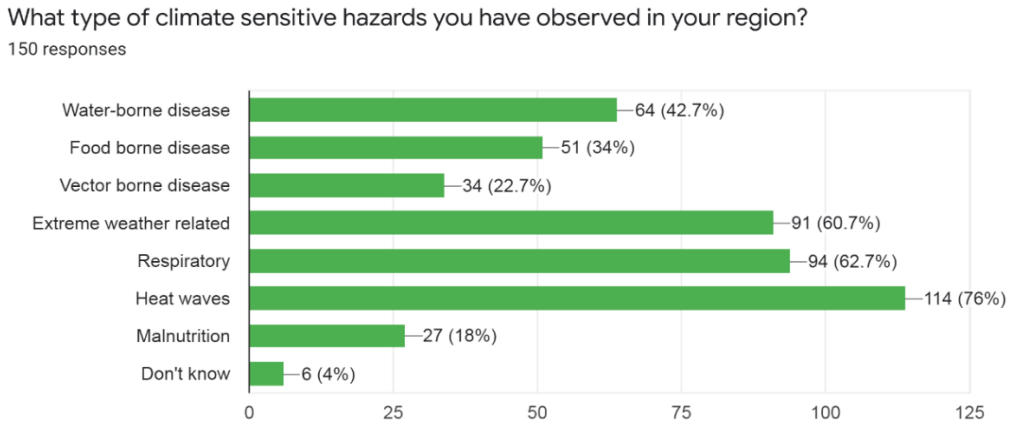

Figure 9- Climate sensitive hazard percentage-wise

The graph below shows different adaptation measures noticed by the respondents. Out of which 99 had noticed plantation of trees in their areas

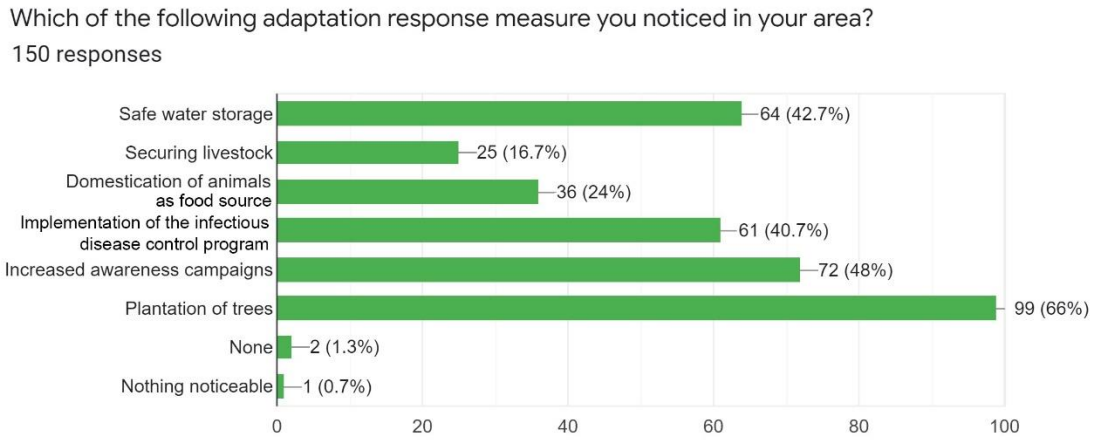

Figure 10- Adaptive measure percentage

70.7% of the respondents think that both developing and developed countries are equally vulnerable to climate change. 24.7% says developing countries are more vulnerable and only 4.7% think developed countries are vulnerable

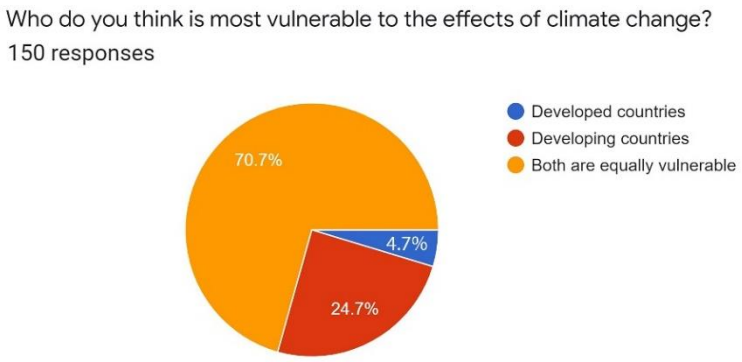

Figure 11- vulnerable countries

.When asked about the climate change awareness campaigns, 34% said that it is been carried out in their region, 38.7% says they are not sure of this and rest 27.3% say it is not carried out.

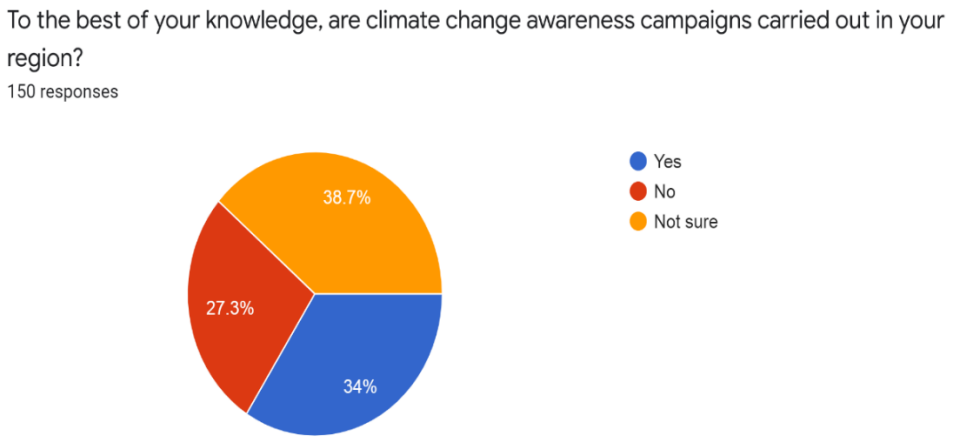

Figure 12- Climate change awareness campaigns

Most people gather information about climate change from the news and television.. Through addition, the participants discover pertinent information in pamphlets, radio, and social media. The graph below illustrates various sources of information about local climate change.

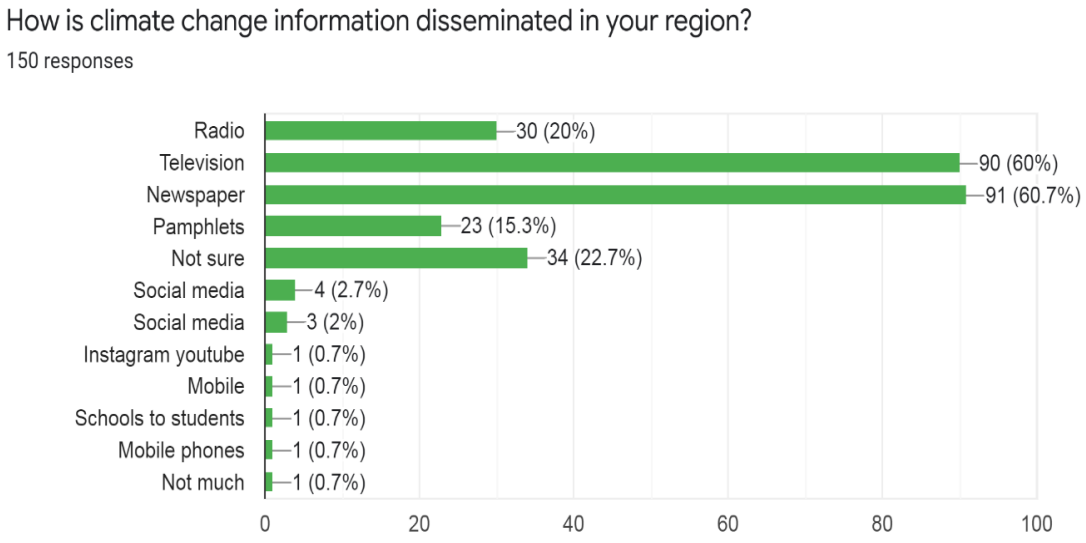

Figure 13 - Information dissemination mode

The below figure shows that 66% of the respondents follow climate change related activities in the country while rest 34% does not follow.

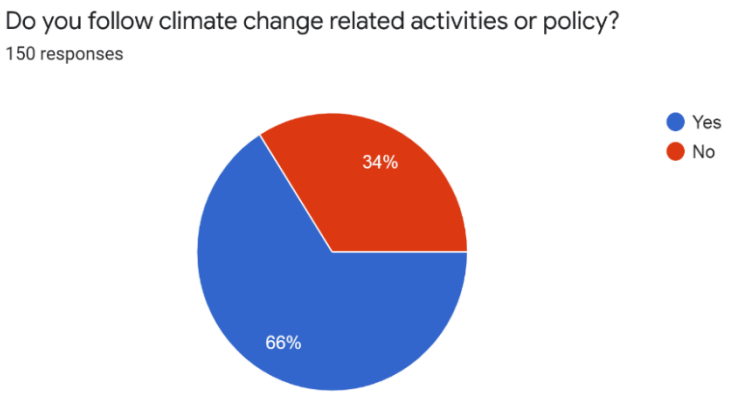

Figure 14 - Percentage-wise people who follow climate policies

Below figure shows, 67.3% believed that enough is not done for climate change, 14% are not sure about it and 18.7% participants' says that actions are being taken.

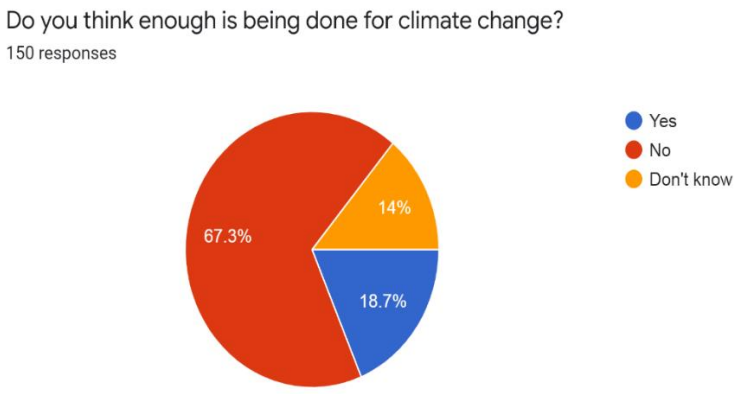

Figure 15 - Percentage-wise opinion on enough being done on climate change

When asked about the main responsibility for the tackling of climate change, 39.3% said that individual should do that, 7.3% business & industry and 4.8% said all of them are equally responsible. Below the pie chart shows the different answer percentages.

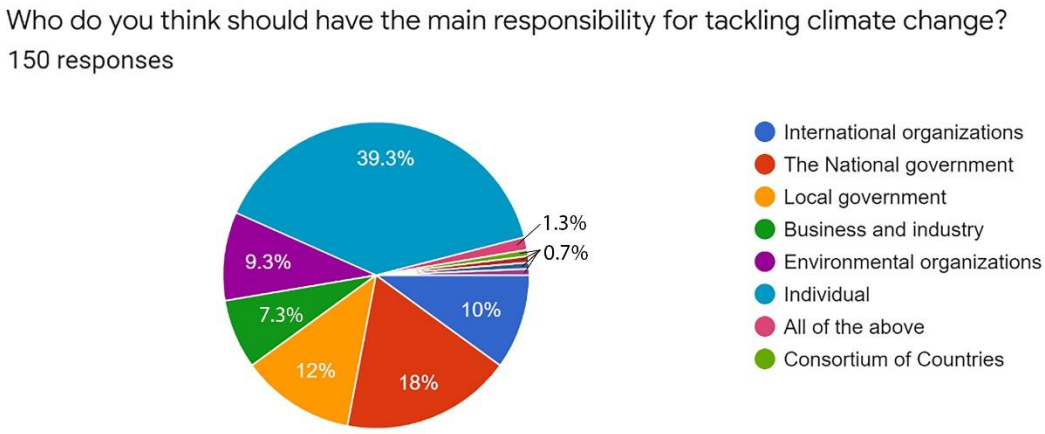

Figure 16 - Responsibility of climate change

The top three priorities of the country according to the respondents are pollution, overpopulation and education

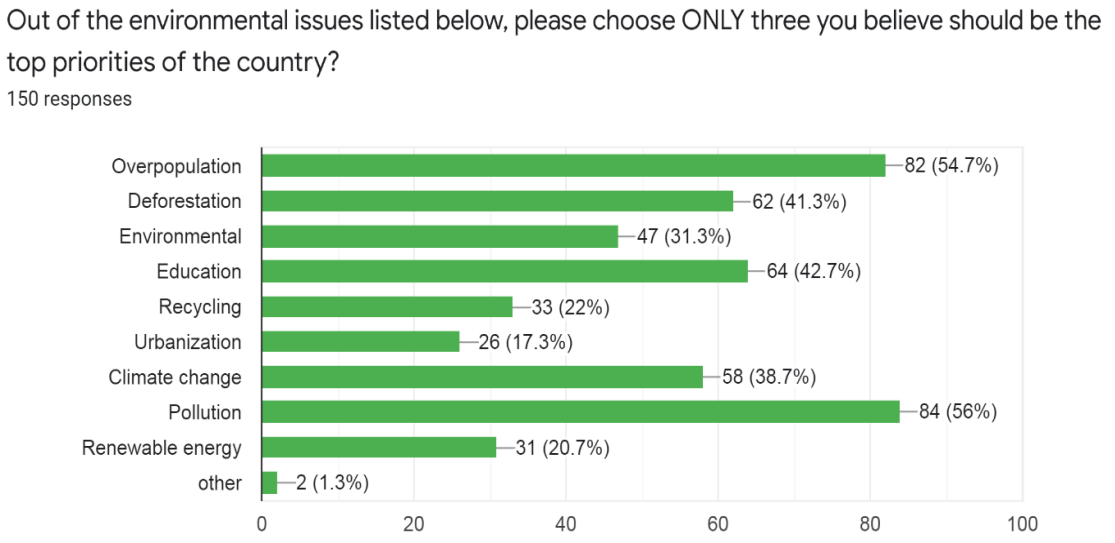

Figure 17 – Important environment issues

The below graph represents people's perception on different statements and climate change.

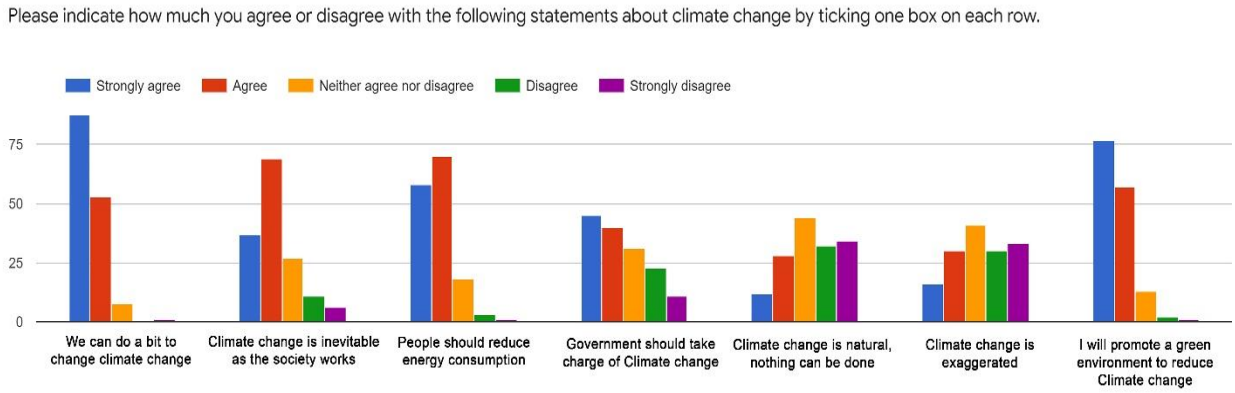

Figure 18 - People's perception on climate change

The question assess respondents attitude towards taking action in concern with climate change. 54% says they take action in concern with climate change.

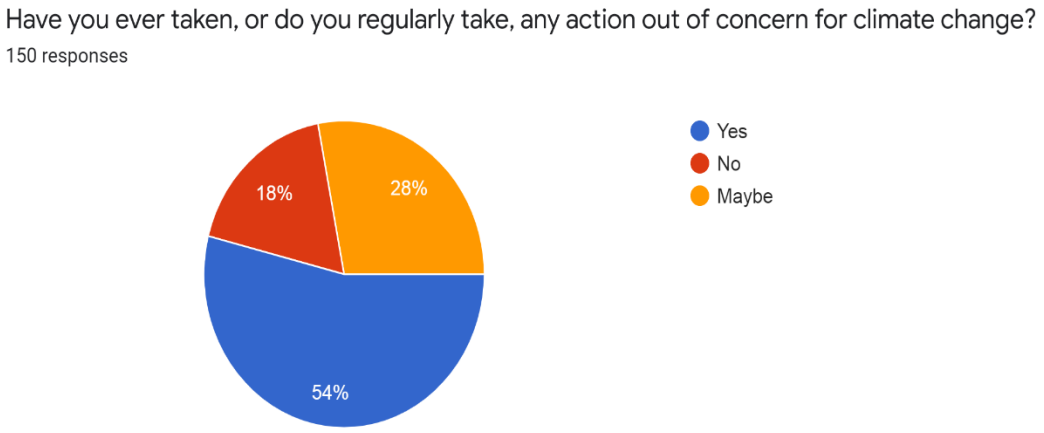

Figure 19 - Action in concern with climate change.

Figure given below assess the future preparedness that the community is willing to take in concern with climate change.

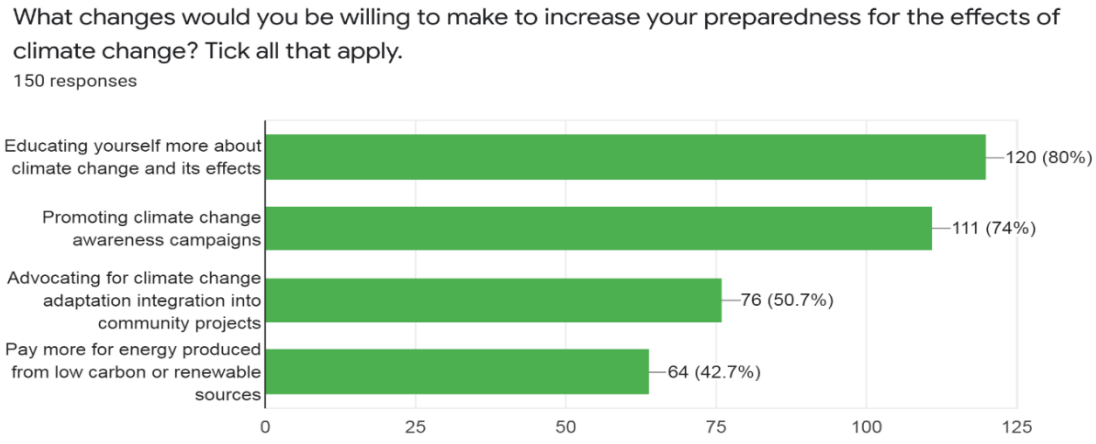

Figure 20 - Percentage of actions respondents are willing to take as future preparedness

The graph below examines whether participants take the environment and climate into account while making choices about their daily and purchasing activities. Activities like using public transport, switching off lights, composting, eating more plant-based diet etc. was asked. It represents the kind of adaptation measures people opt out in concern with climate change.

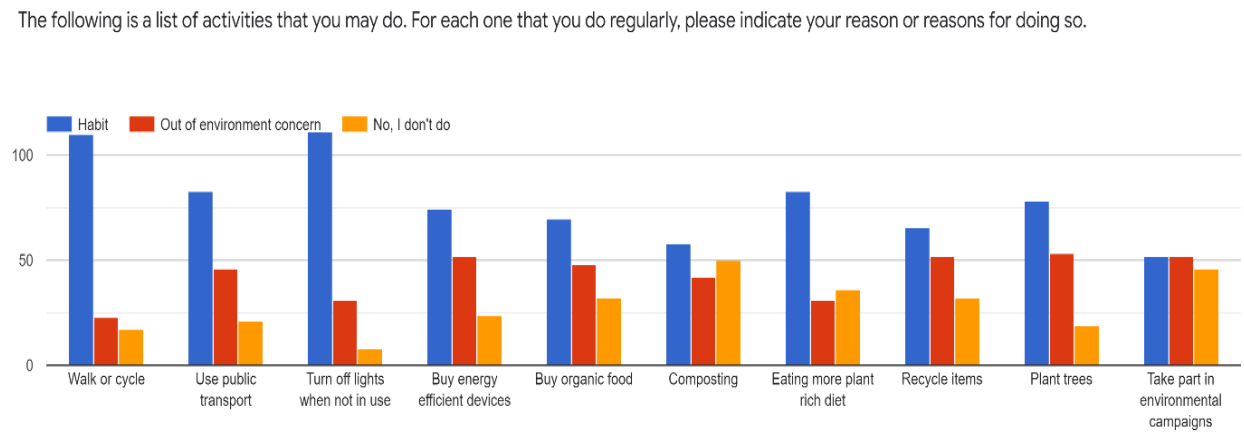

Figure 21 - Adaptive measures

2.9.3 Comparative Analysis

This section shows the comparative analysis of participants' sample with demographic factors. The table below shows the analysis of education, most of the participants who agreed that human activity is responsible for climate change were graduates.

Education * Do you think human activity is responsible for climate change? Crosstabulation

Count

		Do you think human activity is responsible for climate change?			
		Agree	Disagree	Not sure	Total
Education	Graduate	75	2	2	79
	High school	19	0	1	20
	Other	4	0	0	4
	Postgraduate	46	0	1	47
Total		144	2	4	150

Table 1- Education and human activity responsibility

In the below table, both the gender equally think that climate change has impacted their health, a difference could be seen in the option 'may be' where most females are not sure of it.

Gender * In your view, has climate change ever affected your health? Crosstabulation

Count

		In your view, has climate change ever affected your health?			
		Maybe	No	Yes	Total
Gender	Female	18	6	56	80
	Male	8	4	58	70
Total		26	10	114	150

Table 2- Gender and climate change affecting health

Comparing the answers of the question below, when asked about the vulnerability due to climate change, most of them answered as both the developing and developed country being equally vulnerable irrespective of the education.

Education * Who do you think is most vulnerable to the effects of climate change? Crosstabulation

Count

		Who do you think is most vulnerable to the effects of climate change?			
		Both are equally vulnerable	Developed countries	Developing countries	Total
Education	Graduate	55	4	20	79
	High school	14	1	5	20
	Other	4	0	0	4
	Postgraduate	33	2	12	47
Total		106	7	37	150

Table 3- Education and opinion on vulnerability of countries

The table and graph below represent male and female comparison with the climate change awareness campaigns in their region. Most females said they do not know about the campaigns in their region.

Gender * To the best of your knowledge, are climate change awareness campaigns carried out in your region? Crosstabulation

Count

		To the best of your knowledge, are climate change awareness campaigns carried out in your region?			
		No	Not sure	Yes	Total
Gender	Female	28	31	21	80
	Male	13	27	30	70
Total		41	58	51	150

Table 4 – Gender and climate change awareness campaigns

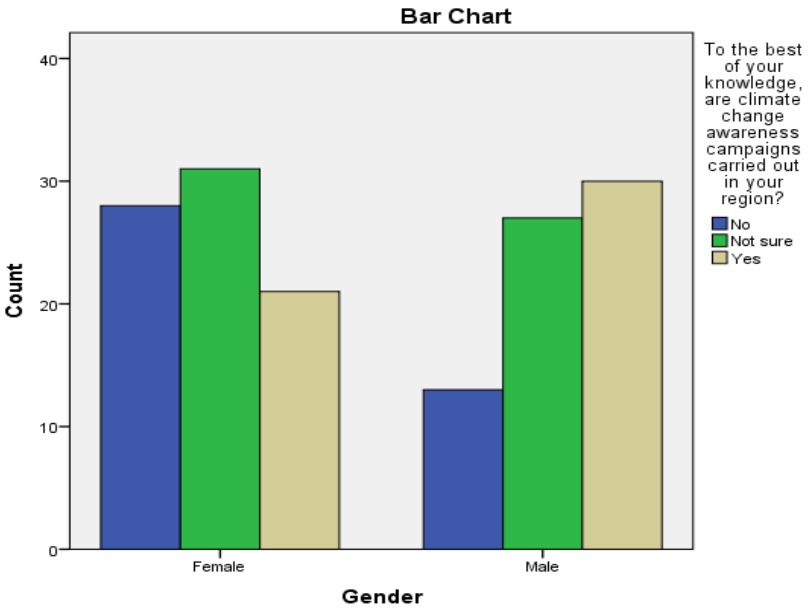

Figure 22 – Bar chart shows gender and climate change awareness campaigns

Interestingly, among these two groups where 50 females and 49 males follow climate related activities where as 30 females and 21 males do not follow climate change related activities.

Gender * Do you follow climate change related activities or policy? Crosstabulation

Count

		Do you follow climate change related activities or policy?		
		No	Yes	Total
Gender	Female	30	50	80
	Male	21	49	70
Total		51	99	150

Table 5 – Gender wise distribution who follow climate related activities

Table and graph below represent the male and female comparison with the action people take in concern with climate change where both equally said yes, but drastic difference can be seen of not being sure about it.

Gender * Have you ever taken, or do you regularly take, any action out of concern for climate change? Crosstabulation

Count

		Have you ever taken, or do you regularly take, any action out of concern for climate change?			
		Maybe	No	Yes	Total
Gender	Female	26	14	40	80
	Male	16	13	41	70
Total		42	27	81	150

Table 6 – Gender amd action taken for climate change

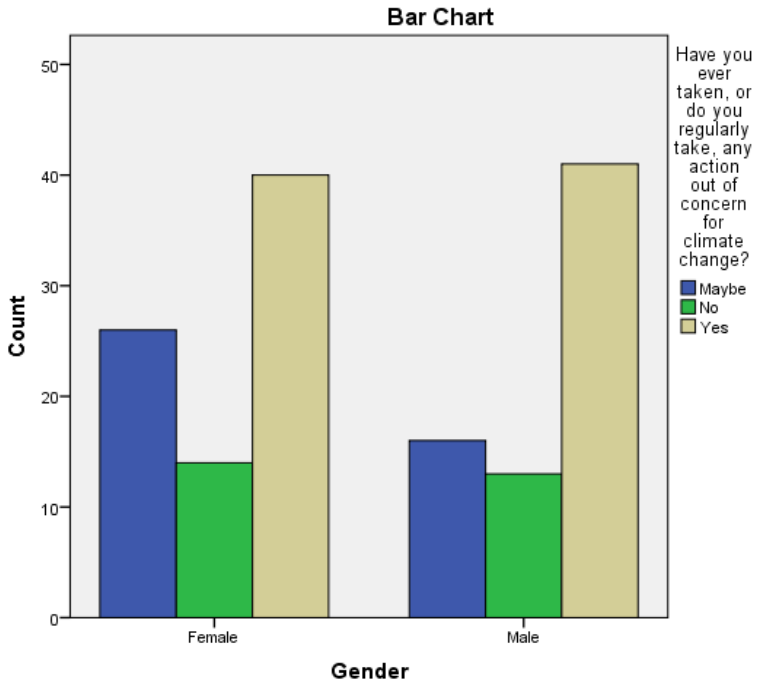

Figure 23 - Bar graph shows gender amd action taken for climate change

2.10. DISCUSSION

Participants of this online questionnaire cover age groups of 18-56, which covers both the gender. Most of the participants were graduate and come from different profession like banking, architecture, health professionals, engineers, teacher, and much more.

It could be assessed that people aware of climate change and are informed about the events that are caused by it.

Seasonal variations were the most obvious environmental change in the last ten years, but a sizable percentage of individuals also noticed temperature changes and extreme weather-related occurrences like heat waves. But the majority of them believe that the weather is altering. Participants recognize increase in the frequency of extreme weather events and attribute it to human activities.

Participants are also aware of the climate sensitive hazards which are taking place in their regions. But a lack of clarity could be seen in the adaptation measures taken to tackle climate related events. According to the studies, most vulnerable to climate change is developing countries but most of the respondents answered that both are equally vulnerable. Even respondents were not sure of climate awareness campaigns in their region.

Majority of the respondents agreed of not enough being done for climate change.

According to the results, 39.3% believed that individual should take the responsibility,18% thought national government should, 10% says international organization should take responsibility and 9.3% think environment organization should take responsibility.

50.7% participants are most willing to pay more for energy produced from renewable sources of energy, mostly agreed to educate themselves about climate change (80%), support climate change

awareness campaigns (74%) and advocate for climate change adaptation (50.7%), when it comes to activities that can mitigate climate change (42.7 percent).

This study unequivocally shows that greater effort should be put into sharing climate-sensitive awareness initiatives and disseminating information. Designing climate change campaigns with the intention of resulting in the distribution of understandable and beneficial information requires specific consideration. Additionally, this campaign should be used to begin public outreach, climate change initiatives, and long-term potential solutions that can undoubtedly lower emissions to combat climate change.

Besides all, in the comment section at the end of the questionnaire, participants felt that the problem is real and more individual and governmental efforts are required. In order to continue engaging the public in the decision-making process related to climate change, decision-makers need build on this promising momentum.

2.11. CONCLUSION

There is no way to emphasize how urgent the climate problem is. Longer heat waves, lower food yields, and reduced freshwater reserves have already had an impact on the world. If immediate action is not made to reduce emissions over the coming decades, the globe will be locked in to rising temperatures, with repercussions that will only worsen and endanger major of the global population and natural systems. The majority of governments in the world are aware of the existential threat that climate change poses, but their current efforts to lessen this threat are far from sufficient.

So, it is suggested that awareness campaigns/programs regarding global warming and measures to combat the climate change should be done to improve the condition. People’s awareness and

attitude play an important role in reducing emission, asking questions about policies, being part of environmental programs.

Also, community perception can help in designing intervention according to them.

2.12. LIMITATIONS

- This study has few limitations as it was an online survey, no face to face interaction was possible.
- There could be bias in response, particularly about the practice of adaptative and mitigative measures which are mentioned by the respondents in the survey.

CHAPTER 3 – SUPPLEMENTARY

3.1. CONSENT FORM

Namaste. My name is Supriya Sarkar, a student at International Institute of Health Management and Research, Delhi. I am conducting this study as a part of my PGDHM program. The title of the study is "Assessing knowledge, awareness and attitude towards climate change". As you know that climate change has become one of the most important environmental issues both nationally and internationally and via this survey I am trying to capture about the awareness, knowledge, and attitude of the community towards climate change. This survey will take approximately 10 minutes. Your participation, in this study, is purely voluntary. You have the right to choose not to take part in this study. If you choose to take part, and you would have to answer a series of questions on climate change. The information that you provide will be kept confidential and will not be disclosed to anyone. It will only be used for study purposes. Your name, and other personal information will be removed from the analysis.

By filling out this survey, you are providing your consent and willing to participate in this survey.

3.2. INSTRUMENTATION

QUESTIONNAIRE-

1. Name of the respondent
2. Gender
    - Male
    - Female
    - Other
3. Age
4. Education
    - High school
    - Graduate
    - Postgraduate
    - Other
5. Profession
    - Government institution
    - Private sector
    - Public sector
    - Academia
    - Student
    - Other

6. Have you noticed any particular changes in the environment or climate in the past 10 years?
    - Sea level rise
    - Drought
    - Coastal erosion
    - Flooding
    - Temperature rise
    - Melting of glacier
    - Desertification
    - Increasing intensity and frequency of extreme weather events like Heat waves
    - Any other

7. Do you feel the pattern of weather is generally changing?
    - Yes

- No
- Maybe

8. What does climate change mean to you?
    - Change in temperature
    - Change in environment
    - Change in weather condition
    - Change in climate due to human pollution
    - Change in climate due to global warming
    - All of the above
    - Don’t know

9. Do you think human activity is responsible for climate change?
    - Agree
    - Disagree
    - Not sure

10. In your view, has climate change ever affected your health?
    - Yes
    - No
    - Maybe

11. What type of climate sensitive hazards you have observed in your region?
    - Water-borne disease
    - Food borne disease
    - Vector borne disease
    - Extreme weather related
    - Respiratory
    - Heat waves
    - Malnutrition
    - No idea
    - Any other

12. Which of the following adaptation response measure you noticed in your area?
    - Safe water storage
    - securing livestock
    - domestication of animals as an alternative food source
    - enhanced implementation of infectious disease control programmes
    - increased awareness campaigns
    - plantation of trees

- any other

13. Who do you think is most vulnerable to the effects of climate change?
    - Developed countries
    - Developing countries
    - Both are equally vulnerable

14. To the best of your knowledge, are climate change awareness campaigns carried out in your region?
    - Yes
    - no
    - not sure

15. How is climate change information disseminated in your region?
    - Radio
    - television
    - newspaper
    - pamphlets
    - other
    - not sure

16. Do you follow climate change related activities or policy?
    - Yes
    - No

17. Do you think enough is being done for climate change?
    - Yes
    - No
    - Don’t know

18. Who do you think should have the main responsibility for tackling climate change?
    - International organizations
    - The national government
    - Local government
    - Business and industry
    - Environmental organizations
    - Individuals
    - Other

19. Of the ten environmental issues listed below, please choose ONLY three you believe should be the top priorities of the country?
    - Overpopulation
    - Deforestation
    - Environmental
    - Education
    - Recycling
    - Urbanization
    - climate change
    - pollution
    - renewable energy
    - other

20. Please indicate how much you agree or disagree with the following statements about climate change by ticking one box on each row: (Agree strongly, Agree, neither agree nor disagree, disagree, strongly disagree)
    - We can all do our bit to reduce the effects of climate change
    - Climate change is inevitable because of the way modern society works
    - People should be made to reduce their energy consumption if it reduces climate change
    - Government should solely take charge of climate change issues
    - Climate change is a natural phenomenon, we can't do anything about it
    - The climate change topic is exaggerated by the media, in fact it is not that big of a deal
    - I will promote a greener environment and participate in initiatives to reduce climate change

21. Have you ever taken, or do you regularly take, any action out of concern for climate change?
    - Yes
    - no
    - may be

22. What changes would you be willing to make to increase your preparedness for the effects of climate change? Tick all that apply.
    - Educating yourself more about climate change and its effects
    - Promoting climate change awareness campaigns
    - Advocating for climate change adaptation integration into community projects
    - Pay more for energy produced from low carbon or renewable sources

23. The following is a list of activities that you may do. For each one that you do regularly, please indicate your reason or reasons for doing so. (reason listed as option like habit, to save money, out of environment concern, no I don’t do)
    - Walk or cycle

- Use public transport
- Turn off lights when not in use
- Buy energy efficient devices
- Buy organic food
- Composting
- Eating more plant rich diet
- Recycle items
- Plant trees
- Take part in environmental campaigns

24. Any Comments/Suggestions to increase the awareness about climate change?

3.2. BIBLIOGRAPHY

- AR6 Synthesis Repor, IPCC — Intergovernmental Panel on Climate Change, 2022

  Available from- https://www.ipcc.ch/report/sixth-assessment-report-cycle/

- Climate change, WHO, 2022, Available from- https://www.who.int/health-topics/climate-change#tab=tab_2

- Sixth Assessment Report fact sheet, IPCC, April, 2022, Available from- https://www.ipcc.ch/site/assets/uploads/2022/04/AR6_Factsheet_April_2022.pdf

- Sandra Venghaus, Meike Henseleit and Maria Belka, The impact of climate change awareness on behavioral changes in Germany: changing minds or changing behavior?,February 2022

- Narcisa Maria Oliveira Carvalho Dias, Diogo Guedes Vidal, Hélder Fernando Pedrosa e Sousa et. al, Exploring Associations between Attitudes towards Climate Change and Motivational Human Values, November 2020

- Williamson, K., Satre-Meloy, A., Velasco, K., & Green, K., Climate Change Needs Behavior Change: Making the Case For Behavioral Solutions to Reduce Global Warming, 2018

- Tai-Yi Yu and Tai-Kuei Yu, The Moderating Effects of Students' Personality Traits on Pro-Environmental Behavioral Intentions in Response to Climate Change, November, 2017

- Climate Change and Human Health : A report of the DST's National Knowledge Network Programme on Climate Change and Human Health, June 2016

- Md Iqbal Kabir, Md Bayzidur Rahman, Wayne Smith et. al Knowledge and perception about climate change and human health: findings from a baseline survey among vulnerable communities in Bangladesh, March 2016
- Lorelei C. Tabago, Evaluating Students' Knowledge, Attitude and Perception on Climate Change, January 2016
- Folajogun V. Falaye & Eugenia A. Okwilagwe Assessing the senior school students' Knowledge, attitude and practices related to climate change, 2016
- Jitendra Kumar Sah, Asha Anil Bellad, Mubashir Angolkar, Assessment of Knowledge and Attitude Regarding Global Warming among High School Students of Ramnagar Belagavi city: A cross sectional study, 2015
- Dr Dragana Bojovic, Ars Locus DOOEL, Climate change perception and awareness level: An online survey of the citizens of The Republic of Macedonia, December 2014