



# CLIMATE AND HEALTH

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# ABOUT



Since 2022, the Sustainable Social Development Organization (SSDO) is implementing a project titled “Youth for Civic Action and Reporting on Climate Change through Citizen Journalism in Pakistan”, funded by the Commonwealth Foundation. Through this project, SSDO has trained university students across Punjab studying media and mass communication to understand, report and advocate for policy action, reform and implementation regarding climate change and environment protection. By capacitating them on citizen journalism, this has led to enhanced reporting on climate change and its associated effects in print and online media, with a special focus on personal and human-centric stories that show the devastating effects of climate change felt at the grassroots level in Pakistan. As part of our work, SSDO aims to foster youth-led movements that create greater awareness and advocacy on the issue, leading to sustainable behavior change among citizens, authorities and policymakers.

## **ABOUT SSDO**

SSDO is a non-profit, research-based advocacy organization working on sustainable development across Pakistan through a rights-based, gender-sensitive and inclusive approach. By capacitating, mobilizing and collaborating with policymakers, parliamentarians, government institutions, civil society, media, academia, youth, and religious communities nationwide, SSDO endeavors to create platforms for constructive and citizen-led policy dialogue, recommendations and action.

## **ABOUT THE COMMONWEALTH FOUNDATION**

The Commonwealth Foundation is an intergovernmental organization established by Heads of Government in support of the belief that the Commonwealth is as much an association of peoples as it is of governments. It is the Commonwealth agency for civil society; a unique, stand-alone organization established by, funded by, and reporting to governments. The Foundation is dedicated to strengthening people’s participation in all aspects of public dialogue, to act together and learn from each other to build democratic societies.



# INTRODUCTION

Pakistan, a land of breathtaking beauty, is at a climate crossroads. Rising temperatures, erratic weather patterns, and unpredictable floods threaten not just our landscapes, but our very well-being. Therefore, Climate Optics provides a platform to youth across Pakistan to share their perspective and stories when it comes to the effects of climate change, as well as showcase the innovative initiatives undertaken by them to promote sustainability and climate action.

Pakistan's vibrant youth are at the forefront of facing climate change, both in its environmental impact and its growing threat to public health. The second volume of this E-Magazine is a collection of the best work by these young voices, showcasing their research, experiences, and ideas on how climate change is shaping health outcomes in our country.

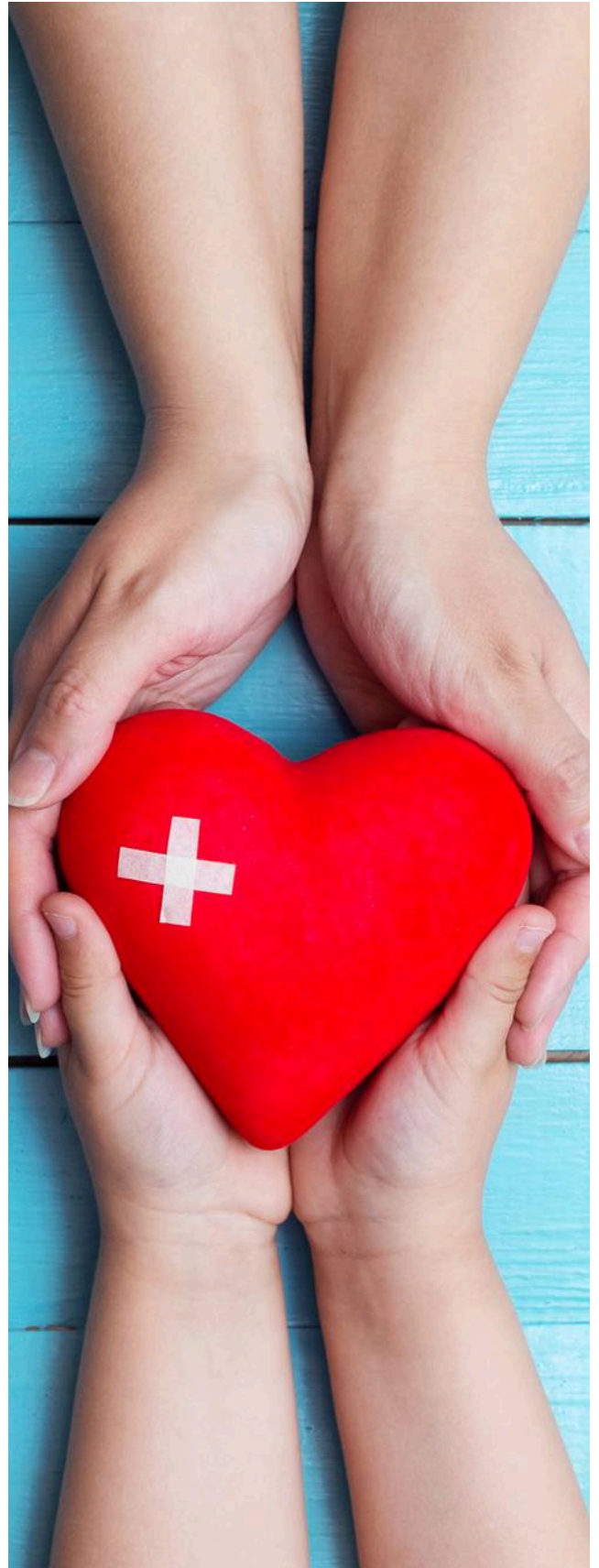
This E-Magazine is a testament to the passion and commitment of Pakistan's youth who are determined to understand and address this critical challenge. Through their work, we can gain a deeper understanding of the climate-health nexus and explore potential solutions to safeguard the health of our communities and our planet. We see the crisis, we understand the risks, and we will not be silent. Join us as we explore the intricate web of climate change and health, and together, fight for a healthier tomorrow for ourselves and generations to come.

# FOREWORD

The planet earth's climate is changing, and its dire consequences for human health is unfolding and visible in many forms. From rising heat waves and extreme weather events to disruptions in food and water security, the impacts are being witnessed across the globe. This e-magazine, "Climate Change and Health," delves into this critical intersection, providing a platform for showcasing the complex ways our warming planet is affecting our well-being.

Ultimately, "Climate Change and Health" is a call to action. It empowers us with knowledge and ignites a sense of collective responsibility. By understanding the challenges and fostering collaboration, we can mitigate the health risks of climate change and build a healthier future for all.

We will discover inspiring blogs written by university students and artwork presented for adapting to climate change, some approaches for vulnerable populations, and policy initiatives being developed to safeguard health in a changing climate.





# Burning of Fossil Fuels

Maila Ishtiaq



Fossil fuels are fashioned from the decomposition of buried carbon-based organisms that died millions of years ago. They invent carbon-rich deposits that are extracted and burned for energy. They are non-renewable and presently deliver around 80% of the global sector's power. They may be extensively utilized to make plastic, metal, and a large range of merchandise. The three kinds of fossil fuels are coal, oil and gasoline.

When fossil fuels are burned, nitrogen oxides are released into the atmosphere, which contributes to the formation of smog and acid rain. The most unusual nitrogen-associated compounds emitted into the air with the aid of human activities are altogether known as nitrogen oxides.



## Burning of Fossil Fuels Affects the Earth's System

The burning of fossil fuels impact the Earth in a variety of ways:

- Releasing of greenhouse gases like carbon dioxide and nitrous oxide into the environment intensifies the greenhouse effect. As a result, the Earth's average temperature rises annually. These greenhouse gases can continue to be in the atmosphere for not only several decades, but also hundreds of years.
- Power plants that burn fossil fuels often use large amounts of freshwater to cool their structures, which can harm local species when the warm water is returned to nearby ecosystems.

## Disadvantages

- Fossil fuels undergo the process of combustion when burnt and emit carbon dioxide.
- They are a non-renewable aid, i.e., as soon as they are used, they cannot be replaced. They can neither be reused nor recycled as well.
- Combustion of fossil fuels makes the environment acidic which unbalances the ecosystem.

The burning of fossil fuels creates climate change and pollution that results in early death, heart attacks, respiratory problems, stroke, and asthma. Moreover, it questions the sustainability of the societies because of the rate at which these resources are utilized, no more will be left for future generations.

## Effects on Health

Air pollution from burning fossil fuels can cause multiple health issues, including bronchial asthma, cancers, and coronary heart disease. Combusting the components of fuel—benzene, toluene, Ethylbenzene, and Xylene—produces carcinogens also known as cancer-causing particles. Globally, fossil gasoline pollutants are accountable for one in five deaths. The environmental influence of fossil fuels disproportionately harms communities of color and occasional earnings groups.

## Negative Impacts of Burning Fossil Fuels on Human Health

- **Respiratory Risks:** While fossil fuels are burned, they release big quantities of carbon dioxide and greenhouse gas into the air, which results in respiratory Risks. The burning of fossil fuels releases air pollutants, including Nitrogen Oxides, Sulfur Dioxide, and volatile organic compounds. These pollutants can irritate the respiratory system, leading to conditions such as asthma, chronic obstructive pulmonary disease (COPD), and bronchitis. Fine particulate matter can penetrate deep into the lungs, leading to inflammation, reduced lung function, and increased susceptibility to respiratory infections. Due to prolonged exposure to these pollutants respiratory symptoms, hospital admissions, and premature mortality have been increased.
- **Cardiovascular Complications:** Fossil fuel burning greatly contributes to the formation of ground-level ozone, a major component of smog, also known as a potent respiratory irritant. Ground-level ozone exposure has been linked with cardiovascular problems such as heart attacks, strokes, and hypertension. In addition, the fossil fuel triggers systematic inflammation and oxidative stress after entering the bloodstream, which can lead to the development of cardiovascular diseases. Long-term exposure to air pollution from fossil fuels has been linked to an increased risk of cardiovascular mortality and morbidity.



- **Cancer Concerns:** A variety of hazardous air pollutants, including benzene, formaldehyde, polycyclic aromatic hydrocarbons (PAHs), and heavy metals like arsenic and nickel are produced by the combustion of fossil fuels. Individuals living close to industrial facilities or urban areas with high levels of air pollution from fossil fuel combustion may face an elevated cancer risk compared to those in less polluted areas.
- **Water pollutants:** Fossil fuel extraction activities, such as hydraulic fracturing and coal mining, can cause groundwater contamination. Fracking involves injecting a mixture of water, sand, and chemicals in water to release natural gas or oil from shale formations. This process can result in the leakage of fracking fluids, methane, and other pollutants into underground aquifers, eventually compromising the quality of drinking water. Similarly, coal mining operations can disrupt underground aquifers, causing the release of heavy metals into water sources. These contaminants pose serious health risks to communities reliant on groundwater for drinking water, including increased cancer risk, neurological disorders, and developmental issues, especially in vulnerable populations like children and pregnant women.

In conclusion, the burning of fossil fuels contributes significant risks to human health, ranging from respiratory and cardiovascular complications to cancer concerns and water contamination. Exposure to air pollutants emitted during burning can lead to respiratory illnesses, cardiovascular diseases, and premature deaths. In addition, the extraction and transportation of fossil fuels can contaminate drinking water sources with toxic chemicals and heavy metals, causing further health hazards to communities. Addressing these risks requires collective efforts to reduce fossil fuel emissions, transitioning to cleaner energy sources, and safeguarding drinking water supplies, particularly in vulnerable communities. Protecting human health from the adverse effects of fossil fuel combustion is not only essential for individual well-being, but also for promoting environmental justice and sustainable development.

**Maila Ishtiaq is a student of International Relations from Lahore College for Women University.**



# Climate Change and its Impact on Health

Anabia Akbar

Long-term changes in weather patterns and temperature are referred to as climate change. These changes can be natural or due to changes in the sun's activity or large volcanic eruptions. Since 1800s, human activities have been the main driving force of climate change, primarily due to the burning of fossil fuels like coal, oil, and gas. Burning fossil fuels generates greenhouse gas emissions which act like a blanket wrapped around the Earth, trapping the sun's heat and raising temperatures. Carbon dioxide and methane are the main greenhouse gases that lead to climate change.

## Impact of Climate Change on Health

### Extreme Weather Events

Climate change intensifies extreme weather events such as floods, cyclones, droughts, and wildfires. These events cause widespread destruction, displacement of populations, loss of lives, and economic destruction. Extreme weather conditions, exacerbated by climate change have devastating impacts on human health across the globe. From heatwaves to hurricanes, floods to wildfires, these events cause diverse and interconnected health risks that affect individuals, communities, and healthcare systems in many ways. Heat-related illnesses such as heatstroke and dehydration, caused by heatwaves pose cardiovascular and respiratory conditions, particularly among vulnerable populations. Hurricanes and tropical storms cause injuries, fatalities, and the spread of infectious diseases, while floods lead to drowning, waterborne diseases, and respiratory illnesses due to contaminated floodwaters and mold growth. Thus, it becomes extremely important to highlight the dire need for climate adaptation, disaster preparedness, and public health interventions to protect the well-being of populations vulnerable to the health impacts of climate change.

### Vector-borne Diseases

Climate change facilitates the spread of vector-borne diseases by altering the geographic distribution and behavior of disease-carrying

vectors such as mosquitoes, ticks, and flies. High temperatures expand the habitats of these vectors, enabling them to thrive in regions previously unsuitable for their survival. Consequently, diseases like malaria, dengue fever, Lyme disease, and Zika virus proliferate, posing significant public health challenges globally.

### Air Quality and Respiratory Health:

The degradation of air quality, worsened by climate change-induced phenomena such as wildfires, dust storms, and increased ozone levels, puts respiratory health at risk and magnifies respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD). Wildfire smoke, laden with particulate matter and toxic pollutants, can cause acute respiratory distress and exacerbate cardiovascular diseases, posing grave risks to both urban and rural populations.

### Mental Health Impacts

The psychological impact of climate change can never be ignored, as individuals struggle with the stress, anxiety, and trauma caused by environmental disasters, displacement, and zero to no surety about the future. Climate-related events such as hurricanes, floods, and wildfires put a negative impact on mental well-being, contributing to post-traumatic stress disorder (PTSD), depression, and other mental health disorders. Vulnerable populations, including indigenous communities and low-income groups, are also affected by climate-induced mental health challenges.

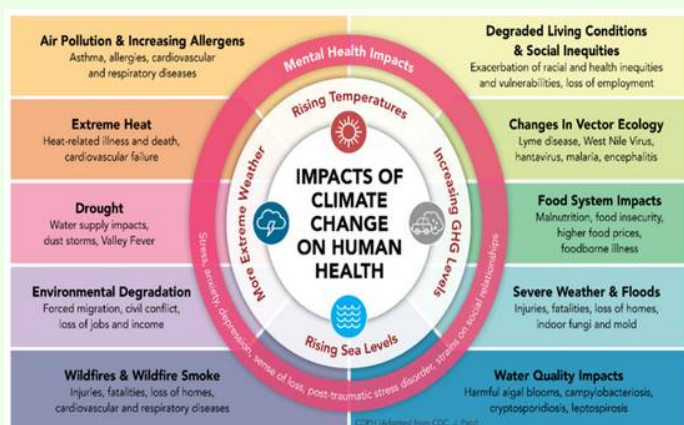
### Agriculture and Food Security

Changes in temperature and precipitation patterns affect crop yields, food production, and livestock. In Pakistan, certain crops are climate-sensitive such as rice, vegetables, cereals, spices, and other grains. Shortage of water caused by rising temperatures and changing rainfall led to problems of food security due to low productivity, especially in the cropped food sector. Climate change disturbs agricultural productivity and water availability, compromising food and

water security for millions worldwide. Erratic rainfall patterns, prolonged droughts, and extreme weather events undermine crop yields and compromise the nutritional quality of food, exacerbating malnutrition and food insecurity. Additionally, contaminated water sources and waterborne diseases further add in the wake of flooding and extreme weather events, heightening the risk of diarrheal diseases and waterborne infections.



Climate change contributes to the spread of infectious diseases, affects air and water quality, and exacerbates health problems due to extreme heat. Environmental hazards like water and air pollution, extreme weather, or chemical exposures can affect human health in a number of ways, from contributing to chronic diseases like cancer or acute illnesses like heat exhaustion. Climate change represents an alarming threat to public health, manifesting in diverse and interconnected ways that demand urgent action. Mitigating the health impacts of climate change requires a multifaceted approach encompassing mitigation strategies, adaptation measures, and investments in public health infrastructure. By addressing the causes of climate change and promoting healthcare systems' resilience, we can mitigate the worse health effects of environmental shifts and safeguard human well-being for generations to come.



*The author is a student of Mass Communication at the Women University Multan.*



# Smog and its Impact on Health

*Kinza Saeed*

Climate change is causing significant changes in our environment, one of which is smog. Smog happens when pollutants mix with the air we breathe, creating a thick fog-like haze. The rise in global temperatures due to climate change makes smog worse by increasing the production of pollutants. Smog can cause health problems like respiratory issues, eye irritation, and even heart conditions. It is crucial to address climate change to reduce smog and protect our health and the environment.



## **Smog Impact on Climate and Health**

Smog is like a silent intruder, sneaking into our atmosphere and causing trouble without being noticed. It is a type of air pollution made up of smoke and fog, thus called "smog". This is not just any fog, it is a harmful mix of pollutants that can have serious consequences for both the environment and our health. It poses threat to public health, with its complex mixture of pollutants contributing to a range of adverse effects. Initially formed from vehicular emissions, industrial activities, and other burning processes, smog carries harmful substances like ozone, nitrogen dioxide, sulfur dioxide, and fine particulate matter. These pollutants can cause serious risks of the respiratory system, causing symptoms such as coughing, wheezing, and shortness of breath, and deadly conditions like asthma and COPD.

Moreover, the detrimental impact of smog encompasses beyond the lungs, causing serious cardiovascular diseases like heart attacks and strokes, as well as neurological disorders such as Alzheimer's and Parkinson's disease. Pregnant women and their unborn children are particularly vulnerable, facing risks of preterm birth and developmental issues. The universal influence of smog even extends to reducing the quality of life, hindering outdoor activities, and diminishing overall well-being. Breathing in smoggy air can be harmful, especially for children, the elderly, and those with respiratory issues like asthma or bronchitis. Smog can cause or worsen breathing problems, coughing, throat irritation, and even more severe respiratory diseases. Long-term exposure to smog has been linked to heart disease, lung cancer, and premature death.

Addressing this urgent health crisis requires collaborative efforts to reduce emissions and implement severe air quality regulations, safeguarding both current and future generations from the perils of smog-induced health hazards.

## **What Creates Smog?**

The main culprits behind smog are pollutants released from burning fossil fuels like coal, oil, and gas. When these fuels are burned in cars, factories, power plants, and even in our homes, they release harmful gases like nitrogen oxides and volatile organic compounds into the air. When these gases react with sunlight, they form ground-level ozone, the primary component of smog.

## **The Impact on Climate**

Smog is not just a local issue; it contributes significantly to global climate change. The gases and particles in smog trap heat in the atmosphere, leading to increased temperatures, a phenomenon known as the greenhouse effect. This warming of the Earth's surface disrupts weather patterns, melts

polar ice caps, and contributes to rising sea levels, endangering ecosystems, and wildlife.

### Steps to Reduce Smog

1. **Cutting Emissions:** We can reduce smog by using cleaner forms of energy, like solar or wind power, and improving fuel efficiency in vehicles.
2. **Public Transport and Carpooling:** Opting for public transport, walking, or carpooling can lessen the number of vehicles on the road, reducing smog-forming emissions.
3. **Planting Trees:** Trees help by absorbing some of the pollutants and producing oxygen, improving air quality.
4. **Supporting Regulations:** Governments can implement and enforce stricter regulations on industries and vehicles to limit emissions and control smog.

Smog might be invisible, but its impact on our climate and health is very real. It is a problem that affects us all, regardless of where we live. By reducing our reliance on fossil fuels and advocating for cleaner air policies, we can work together to clear the air, protect our planet, and ensure a healthier future for everyone.



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# 2050: A World in Crisis – Climate Change and the Battle for Survival

Hudabieyah Attaria

Imagine that the year we are living in right now is 2050. The sky is choked with smog, hot wind is whistling through sky-scrapers, dust devils are dancing, and the oceans are restless. The world is drowning in oceans and food supplies are cut off. Imagine a world with no light, no power, and no living organisms.

The climate is getting worse day by day. Melting glaciers, droughts, migration, increasing sea levels, environmental changes, and devastating ecosystems are not the only outcomes of this phenomenon. The impacts of these changes are even more hazardous. The time for waiting and hoping is over.

## Climate change according to NASA:

*“Climate change is a change in the usual weather found in a place. This could be a change in how much rain a place usually gets in a year. Or it could be a change in a place’s usual temperature for a month or season.”*

## The 1700s to Present: Tracing the Roots of Climate Change

Global warming is increasing the earth’s temperature and the main cause is the greenhouse effect. The consequences of climate vary depending on location, as some areas are getting hotter and others are getting even colder. It started in the 1700s when people started using coal energy and burning fossil fuels. The aftermath of World War II led to an increased use of vehicles as transportation. The burning of fossil fuels is directly proportional to the increase in carbon dioxide.

The effects of climate change are making our living place sink into the oceans. As temperatures increase, the glaciers melt, adding more water to the oceans. Since the 1800s, the average sea level has increased by 8 inches, with 3 inches in just the last 25 years.

It may not seem to be a big deal—just an index finger rise—but 71% of the earth contains water, and adding more water will put the small islands in danger. The news of the sinking of the capital of Indonesia is not hidden from anyone. The sinking of more land will result in a shortage of supplies like living places and food. The decrease in food and then the increase in population is another threat. The increase in demand and decrease in supplies will lead to poverty and conflict. Extreme weather conditions in Africa may result in forest fires forcing the wild ecosystem to migrate, and in this whole process, millions of rare species would die.

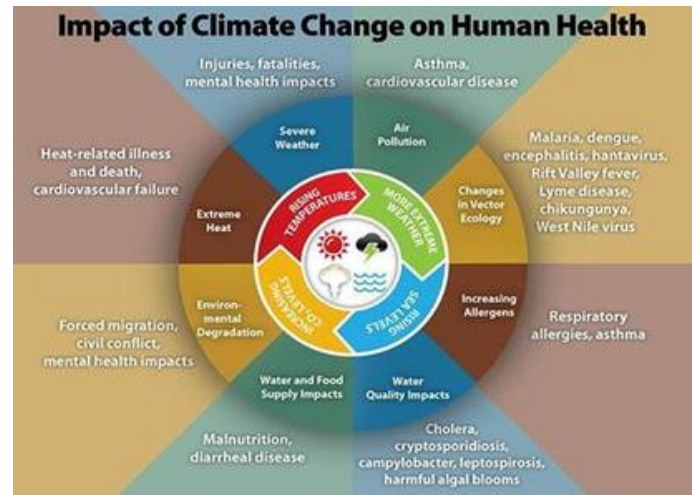
There are over 7,000 glaciers in Pakistan. The exact number is 7253 glaciers: that is more than anywhere else outside the polar regions. However, rising temperatures are causing increasing glacial melt, which in turn is causing flooding. That is not the only problem though. Climate change is increasing the intensity, frequency, and duration of monsoon rainfalls.

This causes a huge rate of migration impacting communities and ecosystems every year. There will be food security issues and water security is already a problem. In the end, all these problems will have a huge effect on national security. Hence, this will not only remain a climate issue. Instead, it will become a national security as well as a political issue.

## Human Health

Food and water are considered basic needs, but our bodies also require the right temperature to feel good. Unfortunately, climate change is causing extreme weather conditions that are unbearable and causing severe disease, sometimes with no expected treatments. Poor air quality, high ultraviolet rays, and infectious diseases are prominent, but this is not limited to physical health. The survey reports of 2023 prove people are facing

mental issues like depression and anxiety due to drastic changes in weather conditions. Even this phenomenon can affect the quality and quantity of food and water. If no steps are taken, extreme weather conditions could lead to over 250,000 deaths by 2025. Some diseases caused by climate change are vector-borne diseases, water-borne diseases, food-borne diseases, respiratory diseases, and heat-related illnesses. High temperatures cause significant risks to human health, particularly during heatwaves and in regions with extreme heat conditions. Continued exposure to extreme temperatures can cause heat-related illnesses like heat exhaustion and heatstroke, resulting in symptoms such as dehydration, dizziness, and even worse, organ failure. Vulnerable populations such as the elderly, infants, and those with chronic illnesses are at heightened risk, with heat waves often linked with increased mortality rates. Beyond physical health, high temperatures can also impact mental well-being, exacerbate air quality issues, and increase the prevalence of waterborne diseases. Furthermore, heat can reduce labor productivity, particularly in outdoor occupations, and worsen existing health conditions such as cardiovascular diseases and respiratory disorders. To address these challenges, it becomes very important to implement detailed measures including heatwave early warning systems, public health campaigns, provision of cooling centers, urban planning strategies, and policies to mitigate climate change and reduce greenhouse gas emissions, all aimed at prioritizing human health in the face of rising temperatures.



If the present circumstances go on without any check, then Pakistan is predicted to experience a greater rise in temperature than the world as a whole; the country's projected temperature increase in the north is anticipated to be greater than in the south. In a nutshell, climate change poses a thoughtful and multi-layered threat to human health, with rising temperatures acting as a primary driving force of worst health outcomes. From intensified heat-related illnesses and mortality during heatwaves to poor air quality, increasing the risk of waterborne diseases, and impacting mental well-being, the health impacts of climate change are wide-ranging and severe. Urgent action is required to limit these effects, including efforts to reduce greenhouse gas emissions, adapt to changing climate conditions, and implement policies and interventions aimed at cushioning vulnerable populations. By addressing the root causes of climate change and prioritizing public health in climate adaptation and mitigation strategies, we can work towards a healthier and more resilient future for all.

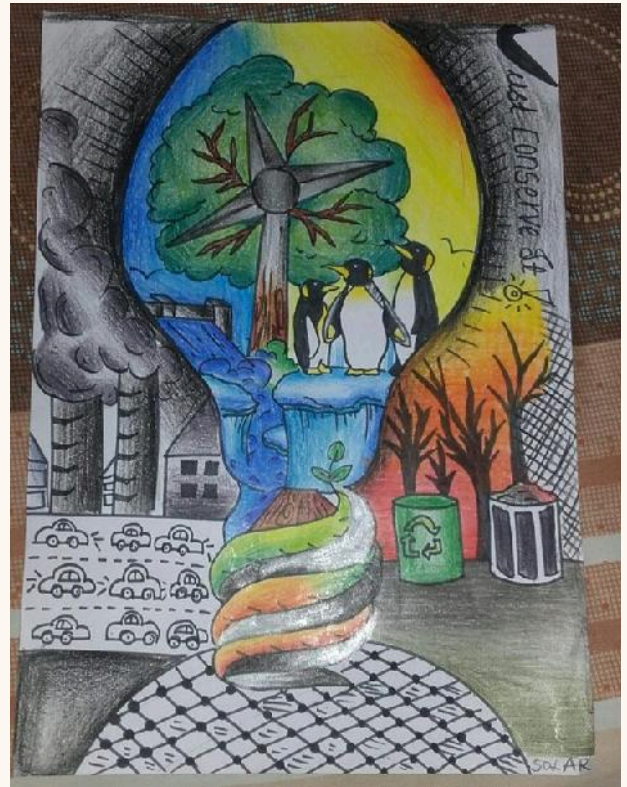
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# ARTWORK CONTRIBUTION



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# ACTIVITIES

Formation and Training of Youth Network of Citizen Journalists on Climate Change










# ACTIVITIES

Awareness Raising, Advocacy and Dialogues by Youth Network







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