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Climate Change and Human Health: Emerging Challenges, Health Risks and Effective Mitigation Strategies for Sustainable Future

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ABSTRACT

Background: Change in environmental temperature and conditions are associated with climate change that influence the health of well-being. The climate of earth has been changed due to global warming. Human activities are the main reason to change intensity of temperature. Climate changes have adverse effects on human health.

Method: The literature study reported that human activities and its deleterious effects on the health outcomes now a days with variation in environment in developing and progression of NCDs. Among findings of the reports the study suggests that increase in temperature has most visible health outcomes and illness. Air pollutants are significant indicator to change the climate conditions and adverse effects on health illness. There is urgent need to accelerate the transition to renewable energy resources to overcome the air pollution for the environment and health of well-beings.

Conclusion: The study addresses the challenges to control air pollution and underscore the potential of public health implications; however, the effective mitigation strategies and AI tools may help to overcome the NCDs by developing warning signs and associate the data of climate change in progression of health problems. The study suggests transformative climate and health action alliance of World Health Organization to build health system and tools to aware against severe effect of climate change.

Keywords: Climate Change; Non-Communicable Disease; Mitigated Strategies; World Health Organization; Perinatal Mood and Anxiety Disorders (PMADs); Chlorofluorocarbons.

1.0. Introduction

Climate change is a problem for our planet. It is happening because of human activities. For example, the polluted agents are released into the air, the way it changes the land and making the Earth get more warmer. This cause big problem with the weather. It messes up the balance of nature. The living biota is being affected by harmful polluted substances. Around 3.6 billion people are living in places where climate change is a problem. Between 2030 and 2050 it is thought that an extra 250,000 people will die every year because of climate change. The chemicals, radiations penetrate inside the cells by respiration or absorbance and cause mutation, disrupts the metabolism of the body. The way climate change affects people is different for men and women. It depends on area, exposure, social activities as where you live. Climate change effects both men and women but it is worse for women by causing the disruption in hormonal mechanism and by causing mental stress (Kılavuz, M., 2025).

The ecosystem destruction and species extinction is due the burden of population growth, urbanization and human activities as combustion, formation of coal, burning of fossil fuel, industrialization, deforestation, emission of harmful radiations, emission of CO2, methane and high connected street networks. The high proportion of such activities are associated with destruction of ecosystem that directly degrade local and regional environment. Climate change increases the risk of infectious disease as vector-borne disease, water borne disease and extreme weather events (Chowdhury, M. A., 2022).

Temperature changes due to air pollution increase the risk of cardiovascular and pulmonary disease. Mental health outcomes, depression, anxiety are main concern due to change in temperature that directly influence the behavior of organism. Still, there is uncertainty that how the climate change alters the stability of species and ecosystem. The food production is limited due to urbanization that cause the malnutrition and lead to famine. High temperature causes the wildfires and disrupts the human health and property. The socioeconomic status are more affected than those of higher status. Children, pregnant women and people with long term health conditions are more vulnerable, to higher temperatures and air pollution (Amin, M.N., 2025).

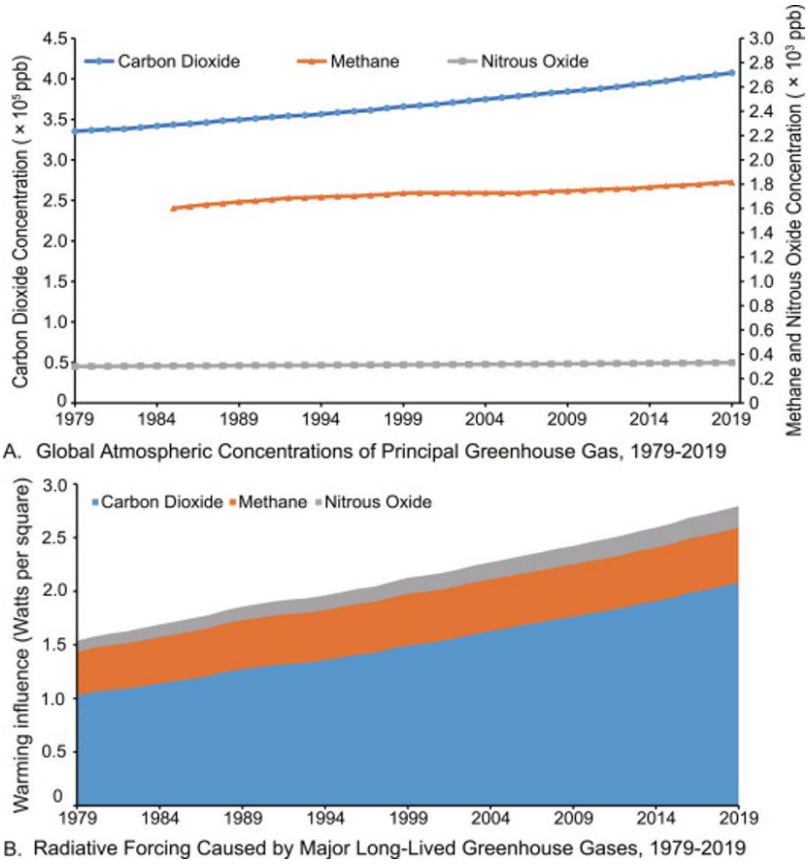


Figure 1. Globally Concentration of Greenhouse Gases (Zhao et al., 2022).

The atmospheric concentration of greenhouse gases is increasing from last decades due to human activities. The combustion of fossil fuel, industrial process, deforestation, radioactive decay, urbanizations and fuel productions. The formation of methane and nitrous oxides take decades to dissociate while oxygen remain steadily in the atmosphere. Global warming is increasing the temperature of earth which has diverse effects on the biodiversity. There should be the mitigation action to check the air quality so that immediate strategies can be planned. The high production of the pollutants destroys the air quality with its side effects on human health on large scale. The radiations produce the free radicals and alter the normal mechanism of the metabolism (Zhao *et al.*, 2022).

People working in high polluted areas are in direct exposure with pollutants, have high chance for pollution related respiratory disease. People have work in field and industries are in direct contact with ophthalmic agents. The presence of organophosphate toxicity damages the respiratory and central nervous system. Direct exposure of radiations causes necrosis, skin damage, cancer and ulcer of the skin. The radiations emit from automobiles;

thermal power stations increase the temperature of earth. These alteration in temperature is crisis for adaptation to humans. These ultraviolet harmful radiations are the main cause of cancer, cardiovascular disease all over the world.

The free radicals are produced by emission of harmful radiations, production of smoke due to incomplete combustions. Free radicals damage the normal metabolic function of body and cause changes. Global temperature is rising due such human activities. People are exposed to high heat are more vulnerable for health problems (Seth *et al*., 2024)

Rapid change in climate is one of the biggest global crises. People in low- and middle-income countries face significant health risks due to the impacts of climate change. Gender differences, in combination with other factors, make women in these countries more susceptible to mental health problems, water insecurity, sanitation concerns, and caregiving burdens. Reducing greenhouse gases and ozone-depleting chemicals, which increase UV exposure is really important for protecting the eyes and brain health. Climate change as hot weather, droughts and other things that irritate eyes and damage the thermostat function of brain will still be a problem for people. These issues will keep affecting people (Anjum., 2025).

The climate and environmental changes in the Global South are really hurting people who are already struggling. These changes are making it worse for them because of social and economic systems and also because of inequalities between men and women. The fact that we are not doing enough to help these people adapt to climate change and reduce its effects is also a big problem. This article looks at how climate change affects public health by human activities. Study focus that climate change is a threat multiplier, making existing health issues more chronic. Study should manipulate the information on the Web of Science and Scopus and looked at studies published from 2018 to now to acknowledge the health challenges due to climate change. Climate change is conjunction with health issues directly. More study is needed to evaluate impact of climate on public health due to increasing human activities. Finally, more research is required to explore solution to the increased demand on the health care in the context of climate change (Ngcamu, B. S.2023).

1.1. Highlights

- Global Warming is the main cause of climate change.
- Most of the non-Communicable disease are developing and progressing due to air pollutants.
- The use of modern technology as microorganisms and AI tools can be used to overcome the deleterious effect of climate on human health.

2.0. Perinatal Period and Environmental Change

Perinatal mood and anxiety disorders (PMADs) occur during the perinatal period, which makes this period a heightened state of vulnerability for such disorders. Emotional trauma is one of the factors that can cause PMADs, which is commonly experienced by victims of extreme weather events (EWEs). The latter, however, occur more often due to the worsening climate crisis. The temperature of stratosphere is increasing due to ozone depletion,

ozone layer absorbs the ultraviolet radiations. The ozone is depleted in the upper layer of stratosphere with endothermic reaction while the reformation of ozone in the middle layer is an exothermic reaction which release heat and temperature is increased. The effect of EWE on stress and anxiety among the perinatal population has not been extensively researched, although available data indicate that there is a negative effect of EWE on perinatal mental health, which should be explored further (Pardon, M. K. 2024).

$$O3 \longrightarrow O2 + O \text{ (Endothermic)}$$
$$O2 + O \longrightarrow O3 \text{ (Exothermic)}$$

3.0. Pollutants and Sources of Air Pollution

Pollutants are harmful to the environment. Primary pollutants are directly produced and emitted substances as ash from volcanic eruption, carbon monoxide from motor vehicle exhaust while the secondary pollutants which are formed by the reaction of the primary pollutants all are effecting the climate to change and have adverse impacts on human health (Manisalidis *et al*., 2020).

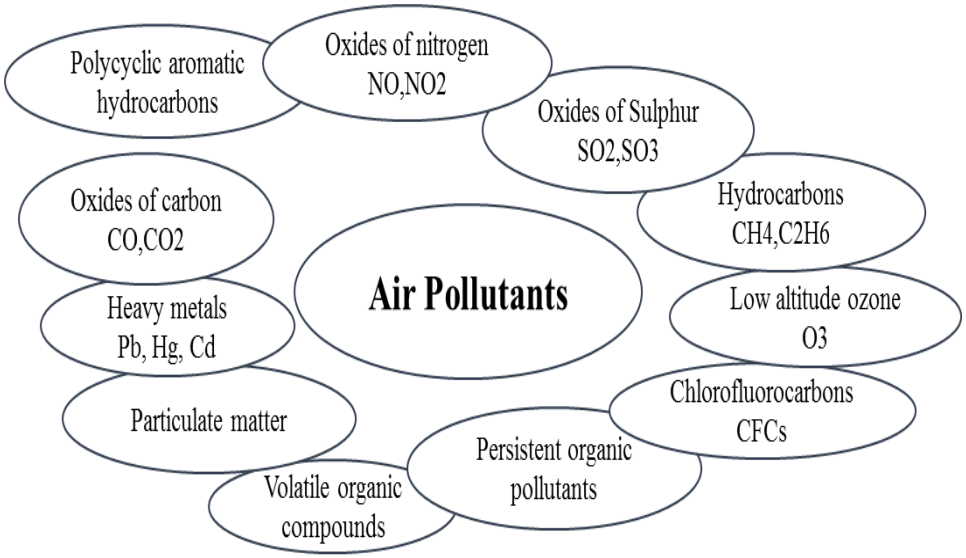


Figure 2. Air Pollutants.

Oxides of Carbon

Carbon monoxide is produced by the incomplete combustion of fossil fuels, highly poisonous and cause suffocation if inhaled. The tendency of CO to bind hemoglobin is more strongly than carbon dioxide. The CO is emitted by the greenhouse by human activities like fossil fuels combustion. This activity also traps heat in the atmosphere and cause the global warming.

$$C + O_2 \longrightarrow CO_2$$

Oxides of Nitrogen

Gases like NO and NO2 are also produced by the burning of fossil fuel. Naturally these are produced by microbial process in soil and oceans and human activities as in the agricultural and industrial process. The N2O contributes to ozone layer of depletion, climate change and change air quality.

$$N_2+O_2 \longrightarrow 2NO$$

$$2NO + O_2 \longrightarrow 2NO_2$$

Oxides of Sulphur

The oxides of Sulphur are SO2 and SO3 emitted by the burning of coal and oil, it reacts with water vapors and form acid rain that cause the destruction of an ecosystem. SO2 is a major reason for acid deposition in the air.

Hydrocarbons

Hydrocarbons are the air pollutants produced by vegetation, wildfires, and volcanoes naturally. These are also produced by the burning of fossil fuel, oil spills, and industrial and vehicles emissions. Methane CH4 is the most common hydrocarbon and air pollutant. Polycyclic aromatic hydrocarbons as naphthalene, anthracene and phenanthrene are also produced by the burning of fossil fuels, vehicles emissions and industrials process.

It also produced by seepage of petroleum and coal. PAHs are toxic and carcinogenic to human health. Similarly, the persistent organic pollutants are organic compounds resistant to degradation by chemical, photolytic and biological process. POPs are toxic, long lasting and harmful to human health and wildlife.

CFCs Chlorofluorocarbons

Ozone is powerful oxidizing agent and is nontoxic if present within the small concentration but a toxic when exceeds above the 100ppm.It is not only harmful for the living organisms but also destroy the materials like rubber, fabric dyes and paints.

Depletion of ozone in the stratosphere by chlorofluorocarbons. CFCs is used in the refrigerators and aerosols. It breakdown in the stratosphere due to UV radiations and released chlorine free radical. These radicals participate in a chain reaction and cause ozone hole. One CFCs have tendency to destroy 100,000 ozone molecules and has more capacity to trap heat than CO.

$$CFCL_3 \longrightarrow CFCL_2 + Cl$$

$$Cl + O_3 \longrightarrow ClO + O_2$$

$$ClO + O \longrightarrow Cl + O_2$$

Sources of Air Pollution

Air pollution is caused by the natural and human sources. Dust on the earth crust formed by the particulate matter, biological materials as pollen, spores and animal debris, Volcanic eruptions, algae emit the hydrogen sulfide and humid zones that release CH4 methane are the natural sources of the air pollution. All of these sources are increasing temperature and quality of air.

Despite the natural sources of air pollution, the human sources are causing the worst change in the temperature and quality of air. Burning of fossil fuels, burning of wood, factories and electric power plants are the main reason for secondary pollutants.

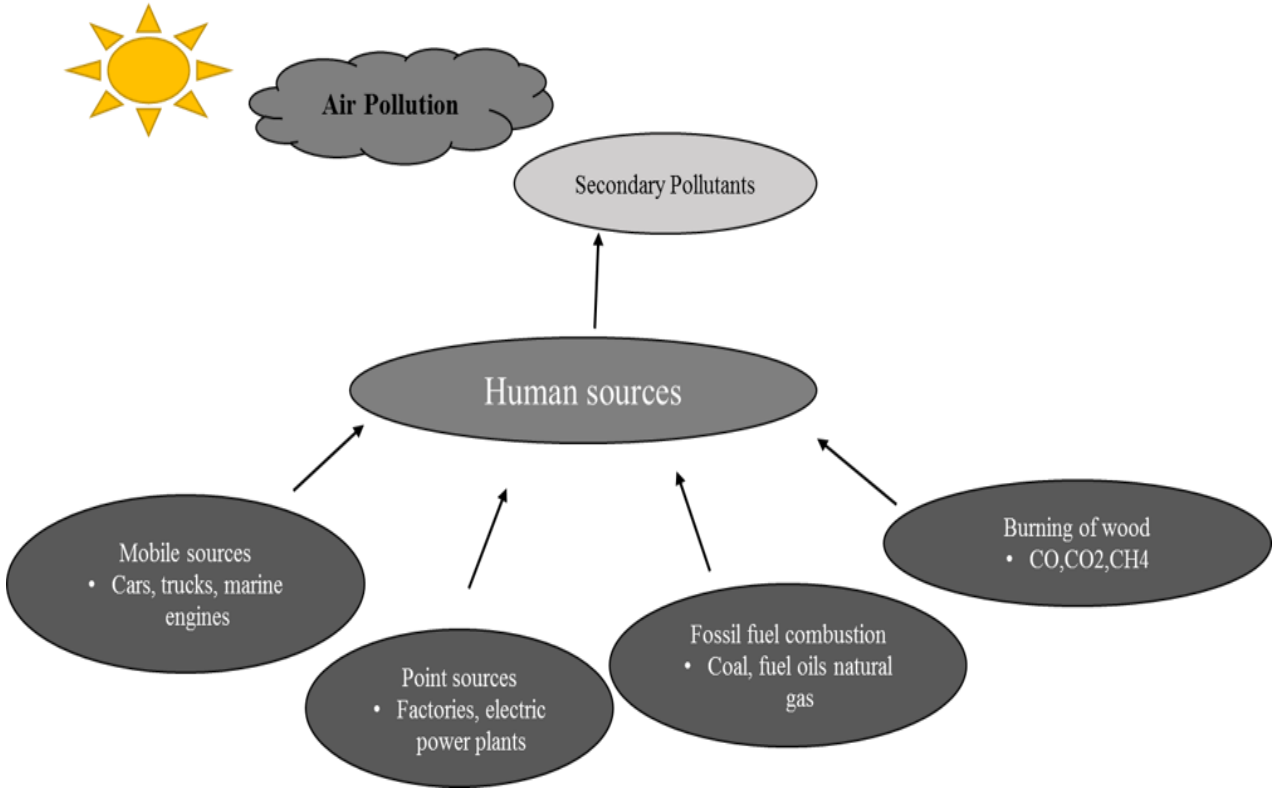


Figure 3. Human made sources of air pollution.

4.0. Climate change and human activities

Human activity has a significant impact on the atmosphere. The main human activity is the burning of fossil fuels and deforestation such activities contribute to air pollution, poor air quality, climate change and other environmental problems. Air pollution in urban areas is raised due to human made sources as trucks, airplanes, marine engines, factories and electric power plants. Burning of fossil fuel alter the earths ecosystem and leads to health problems for human and environment. Fossil fuel burning at high temperature destroy the air quality, emitted greenhouse gases and volatile organic compounds (Lee *et al*., 2021).

Due to human activities, the level of greenhouse gases in the atmosphere has risen significantly, which has led to an increase in the mean temperature of the earth by 1.1° Celsius. Unless there is a significant reduction of greenhouse gases, the mean temperature of the earth will continue to rise to dangerous levels. The consequences of this will include extreme weather changes, worsening of the quality of food, water, and air, worsening of food security, and the outbreak of infectious diseases among humans. Political and economic instability, coupled with migration of large populations, will lead to a reduction of access to healthcare services for the affected persons. Mitigation of, and adaptation to, climate change will be crucial for the survival of mankind during this existential crisis.

Women will be more adversely affected by climate change than men, and pregnant women will be particularly affected. The differential impacts of climate change on women include impacts on heat- and particulate-related diseases, pregnancy, hypertension, and mental health. To prepare for the climate crisis, it is imperative for women's healthcare providers to assist their patients through political advocacy, provide family planning services, and focus on nutrition and lifestyle counseling (Pandipati, S., 2023).

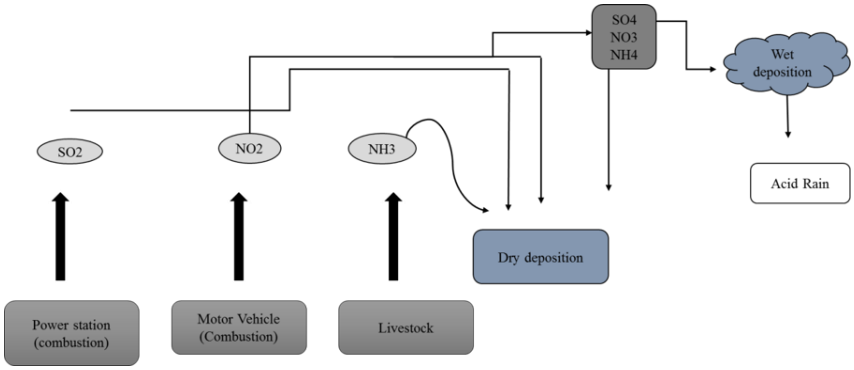


Figure 4. Impact of Air Pollutants on Atmosphere.

Human are the main reason to change the climate adversely. Global warming is increasing by human activities. Air pollution is the main cause of climate change due increase primary and secondary pollutants. Primarily deforestation, burning of fossil fuels, radiations, incomplete combustions all are the reason to change climate rapidly. Deforestation is one of the largest issues in changing global climate. Forest absorbs the greenhouse gases as CO and maintains the quality of air. Due to deforestation the biodiversity is lost, soil degradation, Disruption of water cycle and climate is hanged. Increased radiation and combustion caused the global warming by surface heating; these heatwaves impact as overall temperature rise. High temperature has direct impacts on the health, economy and social behavior. Combustion of fossil fuel, deforestation and industrial emission of hydrocarbons with oxides of carbon effect greenhouse and temperature of the earth is increasing. Rapid increase of temperature causes global warming. Heat waves cause spread of tropical disease (malaria, dengue) cancer and deaths (Sorensen, C *et al*., 2018).

5.0. Effects of Air Pollutants on Environment

5.1. Formation of Smog

Smoke appears as a thick haze, a type of air pollutant. The formation of smoke due to emissions of gases from industries, vehicles and other sources of air pollutants. The smog is a mixture of soot particles with condensed water vapors. The poisonous gases SO2, NO2, O3, CO, CO2 are present in the smog. Secondary pollutants as O3, unburned hydrocarbons, Volatile organic compounds and particulate matters are constituted of smog. Smog is produced by high levels of Sulphur gases known as classical smog. The other form of smog is formed by photochemical reactions of gases in sunlight. The smog cause heart palpitations, pneumonia and lung cancer (Lee *et al*., 2021).

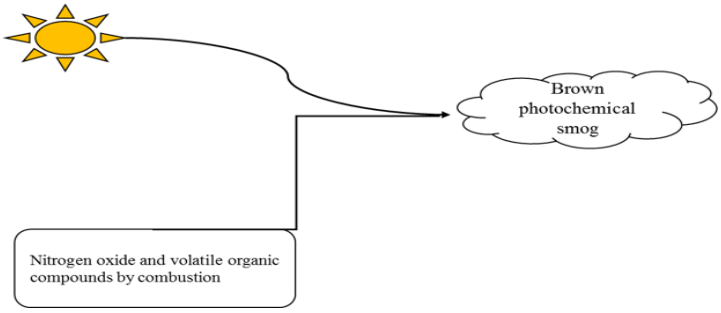


Figure 5. Photochemical Smog.

5.2 Acid Rain

The pollutants produced by the burning of the fossil fuels as sulfur oxides, nitrogen oxides react with water present in air as atmospheric moisture and produce secondary pollutants. It refers as acid precipitation as rain, sleet, fog. Theses acidic droplets travel long distances by wind and cause acid rain. It causes severe environmental damage (Lee et al., 2021).

$$2SO_2 + O_2 \longrightarrow 2SO_3$$
$$SO_3 + H_2O \longrightarrow H_2SO_4$$
$$NO + H_2O \longrightarrow HNO_3 + HNO_2$$

6.0. Study Rationale

In 2023 a study was done to look at how climate change affects people because of racism, xenophobia and discrimination. This study found out that climate change affects some groups of people more than others like people from minority groups, migrants and Indigenous groups. These groups are also the ones who are treated unfairly when it comes to the effects of climate change. A map was made to show which places are responsible for climate change and which places will have more people getting sick or dying because of climate change by 2050. These maps clearly show that people in the Global South will be affected more by climate change. The study uses real life examples, personal stories and looks at policies to explain things better. The people who work in health need to do something about the treatment that is happening right now action should be taken to make sure that climate change does not affect some groups of people, it affects globally on all community. There is need help from the health community to stop the unequal effects of climate change (Abi Deivanayagam, T 2023).

Another study found that climate change and health problems are a threat to everyone. The study looked at how climate change affects the health of women of age which includes women between 14 and 49 years old living in coastal areas of Satkhira district in Bangladesh. The study did a literature review to find the vulnerable coastal areas in Bangladesh. The researchers identified five areas in Shyamnagar upazila of Satkhira district that're most at risk. The study interviewed 25 women and 5 married men. The findings were also checked with health workers and medical officers through interviews. The study found that climate change brings health risks. These include saltwater getting into people’s lives, lack of drinking water and water-borne diseases. Women face health problems. These problems are: Skin diseases, Reproductive diseases, Vector-borne diseases. Women also have a time getting water and good healthcare. They have limited access to hygiene facilities and maternal care. Climate change affects women health a lot. Women of age are more at risk. They face health challenges, so Climate change and health issues are a problem. The study, on climate change and health is very important. It helps us understand the risks of climate change. (Amin, M. N., 2025).

Another report based on the analysis of the literature confirms that climate change indeed affects vulnerable populations negatively, that the mechanisms of adaptability are not used by the government as required by international agreements but contrary to them, and lastly, that vulnerable populations are discriminated against, undermined, and ignored within society to mitigate the effects of climate change-induced calamities. Climate

change impacts have devastated the lives of vulnerable populations to a great extent and are made worse by socio-economic and political differences among people, with the adaptation and mitigation measures being ineffective. The gaps that exist within the current research studies include the lack of empirical data to enlighten us on the measures taken to assist victims of sexual gender-based violence during and after the climate change-induced calamities and the measures taken against the perpetrators of the same crimes. There is also a lack of empirical data to enlighten us on the efficacy of the adaptation and mitigation measures (Ngcamu, B. S. 2023).

Australian mothers who were 18 years or older and had a baby than 12 months old took part in this research. They joined a focus group session and answered an anonymous survey. There were seven group sessions in total. The Australian mothers were asked about their concerns with weather events and how these events affect them. The researchers also asked about their health as mothers. The survey looked at how the Australian mothers were doing as mothers if they were depressed and how they felt about climate change. Thirty-one Australian mothers took part in this research. On average the Australian mothers were 31.74 years old. Most of the mothers lived in Queensland. When the researchers looked at the results of the focus groups they found six themes. The themes that are important for this research are about the health of the Australian mothers. These themes are about the health and well-being of the mothers feeling helpless and trying to avoid dealing with problems. The Australian mothers also talked about being strong and finding ways to deal with problems. Some other themes that came up were feeling traumatized because of weather events worrying about money and the weather feeling alone feeling hopeless about the future and feeling strong. The research shows that extreme weather events and climate change can be very bad for the health of Australian mothers when they are pregnant or have a new baby. This means that we need to do something to help protect the health of Australian mothers. This study shows that extreme weather events can be traumatic for mothers. So we need to support policies that help Australian mothers deal with this issue. The Australian mothers need help to stay safe and healthy. This is very important, for the mothers and their babies (Pardon, M. K. 2024).

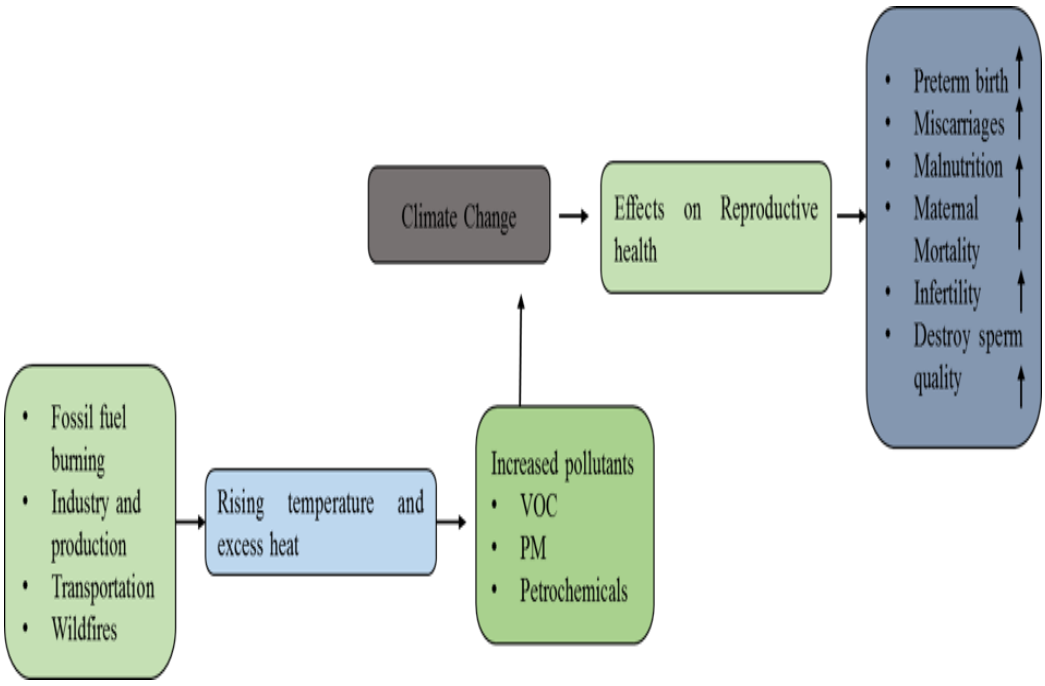


Figure 6. Climate Change and Reproductive Health.

Climate change is really bad for our health. It has been shown that climate change has effects on the health of pregnant women and non-pregnant women. Even though we know a lot about the effects of climate change people often do not think about how it affects women when they talk about climate change or do studies. This is especially true in the United States. Because we do not have information many doctors and the people who make decisions about healthcare do not know much about climate change. This means that the plans we make to deal with climate change are not very good. The people who take care of women health are very important when it comes to dealing with climate change. This healthcare providers need to know what scientists think about climate change so they can figure out which people are most affected and tell their patients about the effects of climate change. Also, the people who take care of women health can be leaders in the healthcare system. Help us deal with climate change and make the healthcare system better for the environment. Climate change is a problem and the people who take care of women health can play a big part, in helping us adapt to climate change (Sbiroli, E., 2022).

In this study we looked at what other researchers have found about climate change and how it affects people's health especially when it comes to having children. We searched through big databases like Google Scholar, PubMed, Science Open and Elsevier. We used five words to find relevant studies: 'climate change' 'fertility' 'health' 'global warming' and how it affects 'woman' and 'man'. We found 25 studies that we could read in full. These studies showed that changes in the weather can affect women periods. It seems that when it gets hotter it can change how often women ovulate, the size of their follicles and how long their periods last. For men we found that higher temperatures can hurt sperm. It can affect how well they move, their quality and how they are made. If a man's sperm is hurt by the heat it can also hurt the embryo if a woman gets pregnant with that sperm. Bad air, which can be caused by climate change can also hurt people's chances of having kids. It can cause problems stress on the body and changes to DNA. Women who breathe air have a harder time getting pregnant and are more likely to lose their pregnancy. When air and water get dirty because of climate change it can hurt people's chances of having kids in ways too. This can happen because people might not have food or a safe place to live. All these things can affect men and women health when it comes to having children. Our study shows that climate change can hurt men and women health in many ways. It's very important for doctors and other health professionals to know about these problems. They should teach people how to deal with the effects of climate change, on their health (Tokat, M. A., 2023). Climate change affects our health, reproductive health and overall well-being. Rising temperatures, due to greenhouse gases trapping heat cause weather, fires and large population movements. This also leads to standing water that spreads diseases. Climate change sets the stage for health challenges that could be catastrophic for the world's population. This review looks at how air pollution, fires, heat stress, floods, toxic chemicals and diseases spread by insects affect fertility in men and women the health of babies and pregnancy outcomes. Doctors and nurses working in health are best placed to educate the public and policymakers on measures to reduce the impact of climate change, on our health now and in the future. They can help us take steps to protect our health and the health of generations. The health of the population depends on it. We must act now (Thalia R. 2022).

The findings have shown that extreme weather events resulting from long periods of extreme heat cause dehydration, heat stress, and pregnancy problems. Water scarcity resulting from climate change makes women susceptible to diseases resulting from contaminated water, for instance, cholera and diarrhea. Lack of food resulting

from repeated crop failures has also led to malnutrition and immunity in women and their households. Women face a number of health problems resulting from inadequate medical attention in cases of extreme weather events. Women in rural areas face gender inequalities in terms of economic empowerment and decision-making power in managing household issues in extreme weather conditions (Matindike, R et al., 2026).

The effects of climate change affect areas of human rights, including health, food, water, sanitation, development and equality for women. Women face a lot of inequality when it comes to climate change. But the amount of money being spent to help women is still not enough. Climate change and sexual and reproductive health rights (SRHR) are closely linked. This connection shows that we need to fund both areas Governments and stakeholders must invest in making women more resilient to climate change. They can do this by investing in SRHR services, family planning and education. Policies that address both health and environmental aspects of women SRHR are needed. This will help ensure that SRHR services continue with the challenges of climate change. People who advocate for climate change should also raise awareness about the connection between climate change and SRHR. This will help people respond to climate change in a way that achieves equality, for women and addresses climate change effectively. The goal is to make sure women have the support they need to deal with climate change. We need to make sure that SRHR services are funded properly to help women. This will help achieve gender and climate justice (Nyathi, D et al., 2026).

The experience of women with food insecurity because of climate change has not been studied much. In Pishigu, which's in the Karaga District a study was done with 384 women in March 2025. This study used methods to measure food insecurity the effect of climate change on food the health of the women and the variety of food they eat. The study found that a lot of women 93.4 percent did not have food and more than half of them 52.6 percent had a big problem with food, which is more than the average in the country and the region. Most of the women two-thirds said that they had less food over the past five years because of climate change, which affected everything related to food. They lost crops and livestock they had less space to store food and they had less money. The women had a time getting a variety of food only 30.2 percent of them had a good diet. The women general health was also not good it was lower than the health of women who live in cities. Some things that made food insecurity worse for women were how money they had how much energy they had, the variety of food they ate what they knew about climate change and what they knew about taking care of their health. Women who knew more about these things had less of a problem with food insecurity. The study looked at food insecurity. It found that women who had a little more money and women who knew more about food and health were less likely to have a big problem with food. Food insecurity is a problem for women, in Pishigu because of climate change (Boxall, J et al., 2026).

7.0. Physiological disorder and climate change

7.1. Health Risk of Climate Change

Climate change is the biggest health risk of the twenty-first century. The health risks of climate change to women far outweigh those of men. Though the health risks of climate change to the physical health of individuals is an emerging field of research, the literature on the mental health risks of climate change is less developed. Moreover,

the mental health risks of climate change to women is of special interest because of the disproportionate adverse impacts of climate change and events associated with it on women's health (Stone K., 2022).

The health risks of climate change to individuals, both male and female, manifest differently because of underlying factors such as socioeconomic factors, cultural factors, and physiological factors. Climate change has the potential to exacerbate underlying health disparities between the genders in India and other low- and middle-income countries in the world. The incorporation of a gender perspective in the policy frameworks of climate change, development, and disaster risk reduction can reduce health risks to individuals (Sorensen, C *et al*., 2018).

7.2. Climate change and vector born disease

The rising temperature and pollutants increase the risk of pathogens and vector born disease. The biodiversity is disrupted by change in ecosystem. Most of the growth of plants is stunted and the risk of public health issue is being underestimated. The infectious or vector born disease like malaria, dengue, zika has been complex due to potential effect of climate change. Climate change influences the human, non-human reservoirs, pathogens and vectors by interacting with so many variables. Excess rain fall and draughts increase the productivity of mosquito born disease. Dengue and malaria are caused by mosquito- that a vector foe disease. With many infectious disease the control of disease should be plan to eradicate the vector. The impact of climate change should fully understand to resolve its broader ecological impact (Thomson *et al*., 2022).

7.3. Association of non-communicable disease with air pollution

Air pollution causes serious health problems to humans. The effect can be adverse from acute to chronic, it depends on the type and concentration of air pollutants, duration of exposure and individuals' susceptibility. Air pollutants as ozone, particulate matter, nitrogen oxides produce worsen asthma symptoms and trigger asthma attacks. Long term exposure of theses pollutants causes persistent cough and respiratory infections as pneumonia.

Exposure of air pollutants also cause the risk of heart attacks. This occurs by mechanism as inflammation, damage of blood vessels, high blood pressure and heart attack. Similarly, the particulate matter and carcinogens cause cancer. The short wavelength radiations cause skin cancer, lung cancer and mutation. Reproductive health and fertility also effect both in male and female by air pollution. It causes premature birth and developmental problems in newborns.

7.4. Temperature changes and risk of deaths

Every year England and Wales see a lot of deaths because of cold temperatures, around 60,500 and some extra deaths because of heat, nearly 800. This is what the complete study on deaths related to outdoor temperatures says. The study found that cold and heat both make the risk of death go up which is what other studies have said before about the health risks of temperatures that're not just right. The number of extra deaths changes in different parts of the country and in different groups of people. Before this study researchers mostly looked at numbers for big areas or specific groups of people. So the team from the London School of Hygiene & Tropical Medicine along with the UK Health Security Agency and other European universities wanted to look at the details of how temperature affects death rates in different areas. They looked at data from 34,753 areas in England and Wales each with around

1600 people over a period of twenty years from January 1 2000 to December 31 2019. They found that there were 10,716,879 deaths from all causes during this time. When they analyzed the data, they found that cold temperatures caused around 60,573 deaths every year and heat caused around 791 extra deaths. This means that for every 100,000 people there were 122.34 deaths from cold and 1.57 extra deaths, from heat every year (Bell *et al*., 2024).

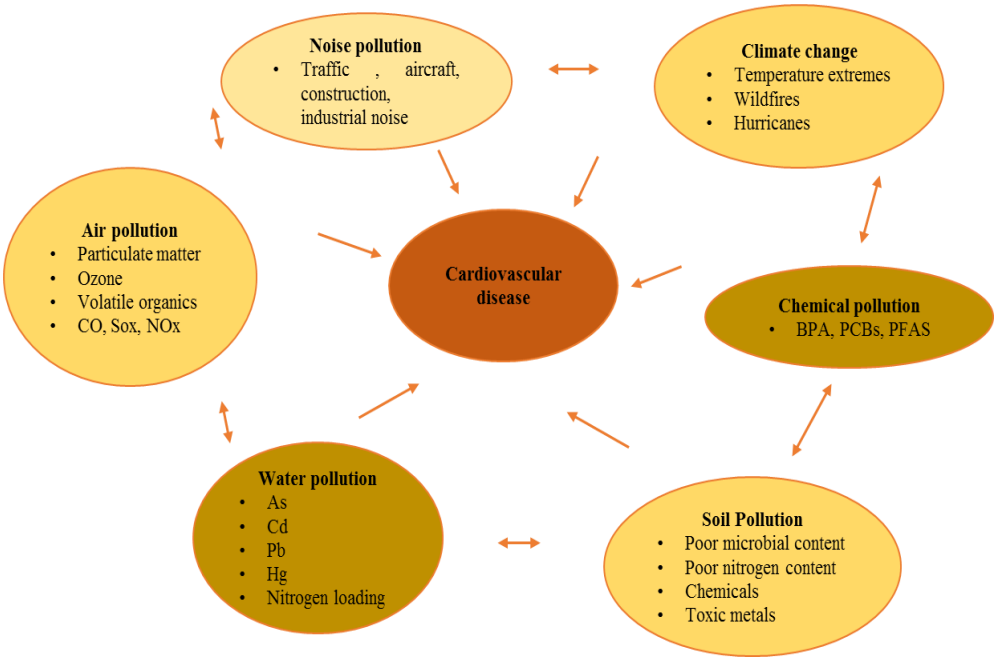


Figure 6. Impact of Climate Change on Cardiovascular Health.

7.5. Optical Physiology and Climate Change

There are things that can cause cataracts. These things include being in the sun and getting too much UV radiation the genes we get from our parents and getting older. When we have cataracts the lenses, in our eyes get cloudy. It is hard to see clearly. A lot of people have cataracts. About 94 million people have this problem. Lately researchers have found something else that can cause cataracts and other problems with our eyes in which the climate change is the main reason (Alryalat et al., 2024).

Climate change is affecting our eye health in ways. The Earth is getting really hot. In fact the Earth's temperature in 2024 was the highest it has ever been. When our body temperature gets too high like 40 degrees Celsius it can cause something called heatstroke. Heatstroke is bad for our body. It messes up the way our body works. When it comes to our eyes heatstroke hurts the systems that keep us safe from things like reactive oxygen species. Climate change is making all of this happen. The Earth's temperature is. That is not good for our eyes. Climate change is a problem, for our eye health. The eye lens is made up of proteins that need to be organized in a certain way to stay clear. When bad things like reactive oxygen species get in they can hurt these proteins. This can cause problems, like opacities that can lead to cataracts, in the eye lens. These proteins are really important for the eye lens to work properly. The lens is not able to fix the proteins on its own. So the more time you spend in the heat the chance you will get cataracts. In Spain Echevarría-Lucas and her colleagues did a study that lasted for 10 years. They found out that for every degree Celsius that the temperature went up there were 370.8 cases of cataracts for every 100,000 people (Waisberg et al., 2023).

Usually, people do not get cataracts until they are 60 years old or older. In some places people who are between 15 and 49 years old got cataracts more often. This happened in areas where a lot of people work in agriculture. Men and Women who spend a lot of time working in the fields are much affected by the heat. Cataracts are a problem for these women because they are outside in the heat for a long time. The heat is very bad for people who get cataracts and cataracts are a problem, for people who work outside. In field the people who spend more time in outdoor and direct exposure of heat is contributing to eye disorder. UV radiations are caused the eye disorders by destroying the eye lens and DNA of lens cell is damaged (Ghosha et al., 2023)

Cataracts are a cause of vision problems globally. Climate change is also linked to cases of eye issues. Some of these issues are Keratitis, which's an inflammation of the cornea the clear outer layer of the eye. The cornea is the part at the front of the eye. Pterygium, a growth of fleshy tissue over the sclera. The sclera is the part of the eye. Conjunctivitis, also known as pinkeye, an infection or irritation of the eye. It causes the eye to become inflamed. Cataracts and climate change are connected to these eye problems. More people are getting cataracts and other eye issues due, to climate change (Waisberg et al., 2023).

Further climate change driven the droughts which results the deficiency of nutrients as copper, vitamins B1, B9, B12. These nutrients are essential for the proper functioning of eye nerve. Similarly, the unsafe water is the main reason for causing eye inflammation and those people who have no any access to drink safe water in rural areas are observed to have eye disorders (Fraser et al., 2024).

We need to find ways to deal with them. Greenhouse gases and ozone-depleting chemicals are contributors, to eye health issues so we need to focus on reducing them. The eye health of people globally will benefit if we can reduce these chemicals.

7.6. Climate change – a threat to brain health

When the brain gets too hot or too cold the brain does not work properly. The brain needs to be at the temperature to work well. Sometimes people have health problems that affect the brains ability to control temperature. This can be because of diseases of the brain. The brain is not able to manage temperature changes when it's diseased. Some people may be taking medication that affects the brains temperature control. The brain is very sensitive, to temperature changes. Whether you have a brain or a diseased brain, temperature changes can affect the way the brain works. The brain is affected by things, including climatic change, diseases of the brain and medication which can change the way the brain works (Jilanee, et al., 2025).

Sometimes people have health issues mainly the brain health due to disruption in thermostat. Means their body has trouble keeping itself at the temperature. They might have brain diseases, which means their brain cannot handle temperature changes well. Some people take medication. This can also affect how their body regulates temperature. Because of all these things the brain can work differently. This can happen in a brain or a brain with diseases, like brain diseases. It does not work in the same way. There are lots of different ways by which the functions of brain are affected due to climate change. The hypothalamus which is a thermostat of the body have suffered in these consequences and results in under or over secretion of hormones. Temperature is more significant for neurological

health, as the superimposed of heatwaves are going to get by people. To damage the brain health the heatwaves are major cause due to global warming. For a healthy brain a good and adequate sleep is more significant. Proper sleep optimizes the metabolism of body and control of non-communicable disease. The sleep patterns are influenced by changing the environmental conditions as climate change. This results in imbalance behavior of hormones in all people especially women. Many neurological conditions need a night sleep. Epilepsy is one example. People, with epilepsy have seizures when they sleep well. If they don't get a night sleep their seizures are harder to control. Sleep helps to treat epilepsy and it depends on external condition (Martínez Lozada et al., 2025).

The quality of the evidence is not the same as you might expect. One of the problems is that we still do not have an understanding of how climate change, heatwaves and bad weather affect the brain especially when it comes to neurological diseases like Alzheimer and Parkinson. The climate change and its effects on the brain is an issue. What that means is that everyone is doing their own thing when it comes to studying it. People are looking at things: different ways to measure temperature how long the heat lasts and what happens after the heatwave is over. All sorts of different ways to do the study. This makes it very hard to compare the results of the studies. Also the studies are not all of the same quality. There are some good studies that have really thought about how climate change affects our health and have worked with climate scientists to do that. And there are others that're not as good that have been done mainly by doctors. So experts in their field but who do not necessarily understand the effects of climate changes (Jilanee, et al., 2025).

7.7. Mental Health Challenges

A specific study sought to investigate the effects of climate change on the mental health of vulnerable groups, including the poor, indigenous populations, children, women, and the elderly, in order to highlight their specific vulnerabilities. The study is relevant to the Sustainable Development Goals set by the United Nations, including goal 3 on good health and well-being and goal 13 on climate action. The study is informed by the social vulnerability theory, which focuses on the effects of climate change on the mental health of vulnerable groups. This study used a wide search of academic databases to qualitatively synthesize data from 35 peer-reviewed articles published between 2000 and 2023. The study found that climate change contributes to the worsening of mental health conditions such as anxiety disorders, depression, and PTSD among vulnerable groups due to their poor adaptive capacity to climate change. Vulnerable groups include indigenous populations and poor populations who experience increased psychological effects of climate change, including eco-anxiety and solastalgia. The results of the research underscore the need to incorporate mental health concerns into climate adaptation strategies, as well as the development of strategies to improve the resilience of the affected groups. This research is consistent with the global agenda to achieve the sustainable development goals, specifically SDG 10 and SDG 11 (Fahrudin, A., 2025).

These climate change-related disasters are resulting in detrimental effects on the mental health of women through post-traumatic stress disorders (PTSD), depression, anxiety, substance abuse or misuse, and suicidal thoughts. In addition to this, the effects of climate change are also having a bearing on the overall well-being of the individual. Thus, in light of the various avenues through which the effects of climate change manifest their impact on the various factors related to mental health, it becomes imperative that we inform appropriate interventions. Thus,

appropriate interventions such as social support interventions, family interventions, bibliotherapy in the management of depression and anxiety. In addition to this, population-level interventions, changes in mental health policies, and psychosocial interventions that focus on climate justice can reduce the current and future mental health burden while simultaneously improving the conditions that foster well-being and equality. Thus, the impact of climate change on the mental health of the individual and the role of religion need to be given greater importance (Nkoulete, P. K. 2025).

Recent findings suggest that climate change exposes individuals to heat, air, pollution, poor food quality, and infectious diseases, all of which have a considerable direct impact on gender and mental health. It has the potential to act as a risk amplifier for health and to exacerbate inequalities. These environmental factors have a multi-faceted effect on individuals and have the potential to result in depression, suicide, violent victimization, post-traumatic stress disorder, and other mental health problems. Women are also exposed to climate-related psychological risk factors. Thus, the study aims to examine the effect of climate change on the mental health of women and also the role of religion and its impact on the mental health of women. It employed the scoping review methodology to extensively review the literature on the various avenues through which climate change affects gender and mental health from the relevant disciplines.

8.0. Global Climate Change and Gender Vulnerability

A review was done to see how climate change and health issues for women are connected. The review looked at how climate change affects women health in particular and how policies that consider gender can help reduce the health problems caused by climate change. The people doing the review searched for information in databases like Web of Science and Scopus. They used keywords like climate change, women health and gender inequality to find information. They found 2163 pieces of information. Only 61 of them were useful for the review. It is clear that women are more affected by climate change than men and this makes the differences between men and women even bigger. Women have mental health problems and they have a harder time during pregnancy and childbirth. They also have access to clean water and they have to take care of more people. In countries women are even more affected by climate change because they do not have as many resources or access to healthcare and decision-making. The review shows that it is very important to create policies about climate change that consider the effects on women health and the social and environmental factors that are related to these effects. Climate change policies need to be sensitive, to the needs of women and women's health needs to be a priority. The review highlights the importance of climate change and women's health and how these two issues are connected (Anjum., 2025).

8.1. Association of temperature deaths with age, location and deprivations

The connection between the number of deaths in an area and detailed temperature maps is really important. It also includes things like who lives in the area how money they make, if they have any health problems and what their homes and neighborhoods are like. The local mortality data and temperature maps are linked to these things that make people more vulnerable to heat and cold. This means we can see how different small areas are affected and we can map out where the risks of dying from heat or cold are higher in parts of the two countries. The temperature

maps and local mortality data are used to understand the differences across areas and to map out the variations in temperature-related mortality risks, across the two countries. Their study, published in The Lancet Planetary Health found differences in various areas and groups of people (Stone, K., 2022).

The risk of death from cold was highest in the North East of England and Wales. These areas had 140.45 and 136.95 extra deaths per 100,000 people, respectively. London had 5,800 cold-related extra deaths each year. It had the lowest risk from cold temperatures with 113.97 deaths, per 100,000 people. Excess deaths were different in groups of people the researchers found. The effects of weather and also heat were seen more often in poor areas. Older people like people over 85 years old were the most likely to die from heat and cold. The risk of death from these things was twice as high for people over 85 years old compared to people who were, between 0 and 64 years old.

The mapping of health issues can help find areas and groups of people that're at high risk. The results showed that heat and cold had an impact on areas that are less well off. Understanding these patterns is important to create health policies for local and national governments to protect people who are more vulnerable. This is especially true, during the cost of living crisis, where deprived areas and vulnerable groups need to be protected from health burdens caused by heat and cold (Stone, K., 2022).

8.2. Climate Change and Women Health:

Climate change is really bad for human health. A new study just came out. It says that climate change is affecting our reproductive health in big ways. This means that women are more likely to have babies with birth weight or babies that are born too early or babies with birth defects. Climate change is also making women feel really hot when they are going through menopause. One of the notable studies emphasized the risk of preterm birth, which is a consequence of the effects of climate change, both directly and indirectly. Preterm birth refers to birth that occurs before 37 weeks of completed pregnancy. Preterm birth occurs in more than 15 million pregnancies every year. The economic burden of providing health care to preterm infants and their families is more than tens of billions of dollars every year. Preterm birth is a major public health problem that conveys significant costs to preterm birth survivors, their families, and society as a whole. Climate change has been projected to convey a host of effects on health during pregnancy that can result in preterm birth, perinatal death, and long-term health complications. Seven effects of climate change were identified as temperature, precipitation, air quality, food security, displacement, range of vector-borne diseases, and socio-economic inequality that can collectively or individually convey an increased risk of adverse pregnancy outcomes and preterm birth. In particular, although targeted interventions may offset some of the effects of climate change, it is now recognized that the meta-system effects of climate change mean that “for a significant reduction in pregnancy health risks to be realized through effective and long-term strategies, it is now recognized that it is necessary to address: (i) the root cause of climate change; and (ii) vulnerable populations such as pregnancy women through multi-sectoral climate change adaptation strategies (Bátiz, L. F., 2022).

Climate change is really bad for women health. Women who are exposed to heat, dirty air, bad food and getting sick because of climate change have a lot of problems. These problems are not just simple they are very complicated. When women are exposed to climate change, they are more likely to get depressed try to hurt themselves get hurt

by someone have bad memories that they cannot forget and many other mental health issues. Climate change also affects women children, which's very stressful for them. Women may have babies that are born early or babies that are not healthy and this is very sad, for them. We want to talk about how climate change affects women health and what we still need to figure out about this problem (Rothschild, J., 2023).

The climate is. This has a big impact on the health of women and girls. Many big organizations, like the United Nations and private groups know that people are hurting the planet and this is causing a lot of problems. We are seeing problems like not having enough food people not getting the nutrients they need and many people having to move to new places. This is also affecting people's health because of all the stress and trauma they are experiencing. The people who will be affected the most are those who do not have the means to deal with these changes. Climate change is a deal for people who work with women health because women and girls are more likely to be hurt by the changing climate. This is because of factors, including their biology, culture and economic situation. Nurses are in a position to help with this problem because we understand health and people trust us. We can play a role in helping to reduce the effects of climate change and in helping people adapt to the changing climate and its impact on the health of our planet and the health of women and girls. Nurses can make a difference in the fight, against climate change. We should be talking about climate change and how it affects women and girls because climate change is a big problem that affects the health of women and girls (Wright, M. L., 2023).

Another finding is related to "identifying the existing and potential adaptation strategies as well as the obstacles to cope with the effects of climate change in Bangladesh." Because of the increasing number of disasters, people are being displaced to urban centers where natural and artificial challenges are impeding adaptation processes in a sustainable manner. It identified a lack of in-depth knowledge of the vulnerabilities, overlooking the interests of local communities, and a lack of policy and program integration as obstacles to climate change adaptation processes in Bangladesh (Chowdhury, M. A., 2022).

8.3. Socioeconomics and climate change

Human are causing climate change with the things we do like putting things into the air and changing the way we use land. This is making the Earth get too hot. It is disrupting the environment. As a result people are getting sick. There are a lot of people, 3.6 billion who live in places that are really affected by climate change. From 2030 to 2050 a lot more people, 250,000 each year will die from not having food or from getting malaria or diarrhea because of climate change. The thing is, climate change affects men and women differently because of their bodies, where they live and how money they have. Climate change is worse for women. People do not know enough about how climate change's affecting women, in poor countries or how it is affecting women when they are going through menopause. There is need to do research to figure out how climate change and money problems are affecting the people who are most vulnerable. More study is required to evaluate the people's health over time in places with change in temperature so a better strategy is being planned to keep people healthy. Climate change is a problem and we need to understand it better so we can make good policies to help people (Kılavuz, M., 2025).

People who live in small areas, overproduction of population, larger communities and less space are more likely to be affected by climate change. This is because of the way societies in Bangladesh. Women in these areas already

face challenges. The goal of this study was to look at how people are affected by climate change and natural disasters. Study should be there to assess problems that women face because of these changes. A survey was conducted of 260 people, had 15 group discussions in Mongla and Shyamnagar. These places are in Bagerhat and Satkhira districts. A software was used to look at the numbers and the stories people told. The results explained that climate change is causing a lot of problems in Mongla and Shyamnagar. There are cyclones saltwater is getting into the freshwater and the rivers are eroding the banks. This is very bad for people in Mongla and in Shyamnagar they have cyclones, saltwater and big waves. All these problems affect people's life and how they make a living. Women are especially affected because they do not have chances to get an education go to the doctor or get a good job. This is not fair to women. It is hurting them. In the places we studied many people are getting sick. Especially the women who work on fishing boats.

About half of the people in these areas have infections or other problems with their organs. Our study says that something needs to be done to help these women. They need to have ways to make a life in peaceful and heathy environment. All women should be treated fairly and have access to help when they need it. Climate change is affecting women, in these areas and women should be given opportunities to get an education go to the doctor and get a good job. Women should be helped to get out of these problems caused by climate change (Shamsuddoha, M., 2024).

The issue of poverty and climate change is very important in a country like Bangladesh. Bangladesh faces a problem with limited resources in both rural and city areas. Climate change is a worry for the people of Bangladesh. In Bangladesh women are more affected by climate change than men. This is clear from the history of disasters caused by climate change in Bangladesh. Climate change makes women lives harder in ways. It affects their family's food, water and jobs. So women role in dealing with climate change cannot be ignored. However in Bangladesh it's hard to include women in climate change solutions. This is because of relationships between men and women. This study shows that women play a role in adapting to climate change. Women in Bangladesh are crucial in responding to climate change. The country's response to climate change needs to consider women contributions. Women involvement is necessary for climate change adaptation in Bangladesh. The people of Bangladesh must work together to address climate change. Bangladesh needs to prioritize climate change adaptation and mitigation. The government and citizens of Bangladesh must take action, on climate change (Tanjeela, M., 2018).

8.4. Climate change among vulnerable population

The impact of climate change among vulnerable population is worse and is less studied. The climate related disasters, mental health problems and vector borne disease are more common due to climate change among vulnerable populations. Climate change and human activities influence the environment and ecosystem by spreading viral infections, allergic and air way disease associated with morbidity and mortality due to pollutants. Notably, the physical health illness and heat stressors impact on metabolic health is more common among children and adult people. Mental health is more adversely affect due to climate change on people with low socioeconomics, adults, pregnant females, children, newborn, and people with disability or with some medical problems. Literature

concludes that most of vulnerable populations are in danger for health illness due to climate change. Articles provide insight knowledge that mental health illness is raised due to climate change in vulnerable group of populations. Vulnerable population are on high risk for developing mental health risk due to climate change. Literature review concluded that the development of depression, anxiety, suicidal thoughts, non-communicable disease, mental health illness, insomnia are directly and indirectly the results of climate change which impacts more on the vulnerable group in populations. The review illustrates the global climate impact susceptible and vulnerable population in low- and middle-income countries rather than local and non-vulnerable populations.

To prevent the health issues among vulnerable population there should be the mitigated strategies focused on screening and interventions for vulnerable groups. Communities should be engaged in routine education, awareness and screening strategies to mitigate the effect of climate change mainly air pollution in homes and communities (White et al.,2023).

9.0. Possible Solution

9.1. Renewable sources

As the global CO2 emission is uncontrolled due to human activities, the main cause of secondary pollutants. CO2 emission is caused the global warming. Other hydrocarbons CH4, Nitrogen oxides are relatively low in concentration than CO2. Burning of fossil fuel is significant to get the different sources of coal, oil, coke, lignite, anthracite and natural gas. as the energy is produced by this chemical process but on other hand this process is causing the air pollution on a large scale. There should be a mitigation to control the pollute compounds by some biological process, so that the energy can be get and used with the control of air pollution and environment degradation. By this way the biodiversity will not be impact and human health will be sage significantly. Despite of direct combustion of fossil fuel at high temperature and high pressure the electrical burning must be applicable. Renewable energy sources as solar energy, wind and geothermal can significantly mitigate the combustion problems and incomplete combustion. The smoke and harmful gases, fuel combustion produced by automobile engines and vehicle also a major source to increase the CO2 effectively. As a citizen each person should have responsibility to mitigate the air pollution. The control of food waste, livestock management, use of renewable energy can lessen the CO2, CH4, and NO2 effectively (De Souza et al., 2024).

9.2. Reforestation, Bioremediation and Bioreactor

The reforestation can reduce the air pollution by absorb the CO2. The forest and green spaces enhance the capacity to absorb CO2 from atmosphere so, despite deforestation by human activity to fulfil the human needs the afforestation must be in policy. The direct CO2 removal through photosynthesis is supper efficient way to reduce air pollution. Most of the phytoplankton are a massive source for carbon sink. Most of the lichens have tendency to absorb the nitrogen and Sulphur oxides from industrial exhaust so, they react as bioreactors. The algae cell wall has capacity to absorb heavy metals as lead, mercury and cadmium from air or water. These algae are used in bioremediation.

9.3. Phytoremediation

Air pollution is a major risk for destroying human health and ecosystem. The volatile organic compounds, particulate matters are the air pollutants and plants has the capacity to absorb these gases. Plants stomata has the capacity to absorb the pollutants. The air pollutants are absorbed by root of the plants and leaves. Microorganisms that have the symbiotic relationship with plants degrade and transform the air pollutants. The plant- microbe interaction is a significant way not only to reduce the air pollution but also enhance the growth of plants effectively. Phytoremediation efficiency is improved with the presence of microorganisms by producing the nutrients to improve the growth of plant. The use of phytoremediation helps keep the environment green and healthy. This method is good for both nature and people. Phytotechnologies are important, for development. They help ensure the earth stays healthy and can support life for a time (Li et al., 2023).

9.4. Bio filtration

The bio filtration process is used to absorb the gases aromatic hydrocarbons, alcohol and aldehydes that are highly soluble in water. On the other hand gases that are less soluble in water are also processed in bio filtration with different process. Specific enzymes and operating systems improve the efficiency of bio filtration. Different types of bio filters are used and it depends on the type of contaminants and gases. The advancements in the bioreactors and bio filters technologies must be adapted to control the air pollution. The harmful air pollutants can eliminate by this advance technology (Jadoun et al., 2025).

Microalgae and cyanobacteria are really good at cleaning up air pollutants. They can be grown in pools at a cost. Green spaces in cities also help the use of bioreactors can remove pollutants from the air. Stabilizing microorganisms is another technique that helps. Microalgae and cyanobacteria are particularly useful for this. Green spaces and bioreactors are also tools to make air clean in which living organisms breathe.

9.5. Mitigation Air Quality

Air quality is the measure of the concentration of pollutants present in the air at a particular location. Air appears as clear when it has better quality with less amount of solid particles and chemical concentrations. Air becomes hazy with large amount of pollutants and dangerous to health and environment. Air quality is measured in Air quality index. AQI under 50 is consider as a good quality which means it is safe for the health. AQI over 300 is considered hazardous. Outdoor workers are at higher risk due to prolonged exposure of poor air quality. All the hazardous gases produced by combustion, wildfires, PM, and burning of fossil fuel have role to destroy the air quality. Wind, temperature and humidity influence how pollutants are dispersed and concentrated in air. Poor air quality is directly associated with the human health. It has long term and immediate health problems in humans. AQI consists of multiple levels indicating different degrees of air quality. The safest range is the lowest level of AQI. The most hazardous range is the highest AQI level, which indicates extremely poor air quality and serious health risk. By measuring AQI the strategies and steps can be taken on time and people become aware for have direct contact with environment. The nephewlometer also called photometer is used to measure the air quality index, it detects dust, smoke, mist and fumes by measuring the total amount of light they scatter (Ravindiran et al., 2025).

Air quality can measure by

- Continuous emission monitoring system: Monitor gases CO, O2, SO2, NO2, VOCs, and PM.

- Air quality monitoring system: They are fixed monitoring stations located in urban areas and industrial zones, these are equipped with sensors and analysers to measure pollutant level in real time.

- Remote sensing technique: Satellites with sensors can measure atmospheric pollutants over large areas. This provides valuable data on regional and global air quality.

Experiments and data collection to test the air quality

Designing experiment to test hypothesis for air quality is required careful plaining, data collection and analysis. In this the first step is hypothesis and it is tested by collecting air quality data at different times of the day. After this the experiment is designed that includes the plaining the variables of data collection. Monitoring is carried out at busy roads and residential areas. The data is collected on traffic volumes during rush and non-rush hours and compared. The reliable instruments and methods are used for air quality data collection.

Analyse data and interpret air quality

The collected is analysed to determine whether the hypothesis is false or true. The interpretation of results involves understanding to know about:

- Concentration of various pollutants

- Trends over time

- The implication for public health and environmental policy

A general approach includes designing experiments, collecting and analyzing data, testing the hypothesis and developing strategies for air quality improvements.

9.6. Group Based Organization

Climate change problem solution is to make the group-based organizations especially in the overpopulated regions. These organizations are trained in capacity buildings, resources conversations, disasters management and sustainable agriculture management. Trainings should be conducted in a participatory mode with their role in the society to overcome the climate change by using tricycles, organic farming, limited constructions of housing authorities, afforestation and restricted deforestation. Such participatory methods of communications provide the adapted strategies with motivations vulnerable populations to combat climate change problems.

9.7. AI Technology to overcome the climate impacts

The data should be aligned from literature and healthcare centers to evaluate the risk of non-communicable disease with association with environmental changes. AI advanced technology must be used to generate the model that will help to develop the warning signs and analyze the data of climate change impacts in progression of non-communicable disease.

10.0. Conclusion

Study strongly recommend that the climate crisis is recognized as the global crisis, the study evaluates the climatic effects on health mainly in developing NCDs due to highly involvement of pollutants and emerging radiations. If healthcare doesn't get ready to handle challenges with adaptive way, then it will be a big problem to human health. The healthcare sectors need to be prepared to deal harmful radiations to save health for productivity of human population. These kinds of effects are not noticed and that is why people are not ready for them but it has deleterious effects on health. The modern AI technology must be used to develop the warning signs in climate change with effective mitigation effective strategies.

10.1. Future Suggestions

1) Establishment of climate health surveillance system.
2) To focus on climate change induced stressors, cause epigenetic alterations.
3) Incorporation of AI based strategies to detect changes.
4) Use of microbes to overcome the pollution.

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Data Availability

The data should be kept private until its publication.

Authors' contributions

Hira Salamat: Conceptualization, title formulation, writing – original draft preparation, editing, literature search, and review. Saima Sharif: Review and editing, supervision, and critical evaluation of the manuscript. Muhammad Imran Ahmad: Author contribution details not provided. Shagufta Naz: Guidance and academic supervision. Wajeeha Salamat: Manuscript editing and revision.

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