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# Impact of Climate Change on Human Health and Wellbeing in Karnataka

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## Abstract

Although globalization has benefited India in general and Karnataka in particular, there are also some drawbacks of globalization. One such drawback is environmental pollution and its impact on human health. Industrialization in the post-globalization period has increased air, water, and soil pollution. Due to this the problems in human health are increasing, now people living in urban areas are suffering from health problems like asthma, bronchitis, malnutrition, dengue, malaria, allergy, skin diseases etc. So it is essential to prevent all these. Forms of pollution. To conduct the present study, the authors analyzed these research publications under focus groups. The present study is primarily analytical and descriptive. Overall, it recommended planting more trees around residential areas, rejecting permits for industries that increase environmental pollution, and abandoning irrigation, electricity and other projects that destroy forests.

**Keywords:** Climate change; Human health; Environment Pollution; Wellbeing; Karnataka

## 1 Introduction

Karnataka's climate change's effects on people's health and wellbeing Summer-time temperatures that are higher are strongly linked to an enhanced risk of many illnesses in older persons, expectant mothers, and children. Urban residents may feel warm because the additional heat from urban heat islands contributes to persistent warming and is thought to increase the number of heat-related deaths more than the amount of deaths from coal areas<sup>(1)</sup>. The biggest threat to world health in the twenty-first century is climate change." The opening statement provides an overview of the year-long commission that was co-hosted by The Lancet and the University College Lon-

don Institute meant for Global Health. In the absence of adaptation and mitigation, it exacerbates health disparities, especially by adversely affecting the social determinants of health in underprivileged areas<sup>(2)</sup>.

Climate Change Framework Convention Climate change is a way in which human activity directly or indirectly modifies the organization of the Earth's atmosphere. Moreover, natural climate change has also been observed in comparable time. The UNFCCC distinguishes between climate change caused by natural processes and climate change caused by human action that alters the creation of the atmosphere. The complexity of social and environmental factors that influence disease and health outcomes makes

identifying the precise magnitude of this influence important<sup>(3)</sup>. Among the implications of climate change on human health are increasing sea levels, changing precipitation patterns, more frequent or intense extreme weather events, and rising temperatures. These impacts on our health have an impact on the food we consume, the water we drink, and the weather we experience. Numerous factors, such as individual behavior, age, gender, and economic status, as well as the capacity of human health and safety agencies to manage or foresee these changing dangers, influence the extent of these health concerns. Impact of climate change will differ for each individual based on their location, amount of community adaptation, susceptibility to health hazards, and exposure to those effects<sup>(4)</sup>. Given public worries about the detrimental effects of agriculture on both human health and the environment, there is a unique need for conventionally cultivated crops, especially in states where the majority of commodities certified safe for human consumption are farmed<sup>(5)</sup>. Systems that are weed-suppressive, productive, profitable, and protective of both human health and environmental quality can be sustained with the help of human health practices and inputs. Relying more on biological processes and less on synthetic inputs can lead to agricultural practices and reduced harm to human health and the environment<sup>(6)</sup>.

Reasonable behavior, heredity, occupation, exposure to the local environment, and health care appear to play a major role in human health; yet the biosphere's life-supporting functions are necessary for population health to be sustained. Populations of all human health species rely on stable climate conditions, abundance of food and water, absence of excessive infectious disease, and physical safety and comfort. The climate system of a state is essential to this life support. All these conditions are anticipated to be impacted by climate change, which will have a significant effect on people's health and well-being<sup>(7)</sup>. Its long-term goal is to establish a statewide health system that is resilient to climate change. Primary goals include raising public awareness, empowering health professionals, influencing legislation, emphasizing health preparedness, and building and strengthening non-governmental and intergovernmental collaborations. The overall health of the population can be improved by directly or indirectly integrating the concept of human health. Concepts of climate change with human health are being included in health professional training programs along with other initiatives to enhance professional skills<sup>(8)</sup>.

Human health is being negatively impacted by a few climates change-related variables, including heat waves, hurricanes, floods, disruptions in the food chain, zoonoses, food- and water-borne infections, and an increase in the frequency of extreme weather events. Infections and mental health problems are transmitted by vectors<sup>(9)</sup>. Climate change is also having a negative influence on several socio-economic determinants of health, such as social support networks, access to

healthcare, equity, and livelihoods. These climate-complex health risks disproportionately affect the most vulnerable then disadvantaged groups, with women, children, ethnic sections, impoverished communities, migrants or displaced individuals, the ageing, and persons with underlying medical conditions<sup>(10)</sup>. The mean values of the various variables that were recorded in the state during the study period are contained in the climate database. Temperature, relative humidity, air pressure, vapor pressure, and total precipitation are some of these variables. Throughout the day, levels of distinct air chemicals including particulate count, ozone, nitrogen oxides, and carbon monoxide, are measured. The average of the values before and after is used to fill in any missing data. Averages are kept for the parameter to account for any lag between a change in each human health environment and its manifestation<sup>(11)</sup>.

## 2 Theory applied

The best explanation for climate change is found in Marx's model, which holds that the linearity of the capitalist system undermines cyclical natural cycles. Today, one of the main reasons for climate change is agriculture. Marx expounded upon this. An "ecological rift" or "metabolism" exists when natural cycles with linear productive processes are broken between human society and the natural, non-human environment. This ecological divide still exists today.

## 3 Objectives

To Study the Impact of Climate change on human health

## 4 Hypothesis

Ayushman Bharat Arogya Karnataka health scheme is working positively impact compared to human Health

## 5 Understanding of Climate Change

Long-term variations in Karnataka's climate are referred to as climate change. There has been a shift in the predicted weather patterns. Many aspects of climate change, such as variations in rainfall, droughts, more frequent floods, and heat waves, have an impact on human health. The locations where we find shelter are all impacted by climate change. The frequency or severity of excessive weather incidents and the development of specific pests and diseases, climate change can have an impact on people's health and well-being. Water is scarce in most locations, and climate change is altering its availability. water-stressed areas, global warming will make water scarcity worse and raise the possibility of crop-damaging agricultural droughts.

## 6 Methods

Focus groups for qualitative research have been held in Karnataka. The study used a Primary data collection strategy to obtain only Qualitative and quantitative data. Researchers now have the chance to apply their knowledge of climate change to their study thanks to data gathered from numerous government and institutional websites. The researcher gathered information based on specific parameters.

**Table 1. Conceptual Framework**

Impact of Climate Change on Human Health in Karnataka				
Temperature impact	Air Pollution	Water	Food Security	Mental health
Heat wave, Change Atmospheres, Productivity, Occupational Sectors	Cardiovascular failure. Asthma. Cardiovascular Vector Borne Diseases. Airborne, Morbidity and Mortality, Socioeconomic factors,	Lep-tospirosis Cholera Campylobacter Borne Dis-eases	Mal-nutrition Diarrheal disease Humidity Sea-son sole	Allergens Degradation mental, Forced migration. Civil health impacts, Mental illness, well about 7% of adults, was a major report in the past year,

### 6.1 Temperature Impact (Heat Wave)

Climate change-related temperature extremes have an immediate impact on health because they interfere with the body's natural ability to regulate internal temperature. Many ailments, such as heat cramps, heat exhaustion, heat stroke, and hyperthermia from extreme heat events, can result from a loss of internal temperature regulation. Each has a different range of normal body temperature, which is affected by age, activity level, and instance of daytime: C. 36. Exercise that is vigorous can cause the temperature to momentarily climb to 46 C. Fever can be brought on by any infection, including meningitis, appendicitis, cellulitis, skin infections, and bone infections (osteomyelitis). sore throats, ear infections, sinus infections, respiratory infections such as mononucleosis, bronchitis, pneumonia, TB, colds, or flu-like diseases, etc.

Example for the Temperature impact on human health



**Fig. 1. Example for the Temperature impact on human health**

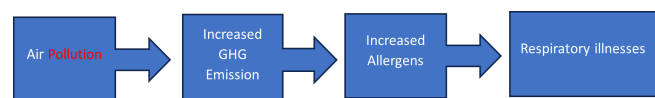
### 6.2 Air Quality Impact

Climate change impacts on human health problems such as respiratory and cardiac disorders can be brought about or worsened by exposure to air pollution. Indoor air quality is affected by climate change. Climate change has several negative impacts on health, increasing the risk of death and illness from more extreme weather events such as heat waves. This is because increases in ozone and outdoor air pollutants lead to greater indoor exposure. Natural disasters including hurricanes and floods, food system disruptions, zoonoses, and vector-, food- and water-borne diseases, as well as an increase in mental health problems These pollutants create a wide range of harmful biological effects in the human body and penetrate deep into the respiratory system. Air pollution is currently the world's greatest environmental health threat.

Increases in ozone: People who breathe in ozone may experience a few climate change-related health issues, including chest pain, sore throats, congestion, and coughing. It may make bronchitis, emphysema, and asthma worse. Ozone impairs lung function and irritates the lining of the lungs. Repeated exposure might cause irreversible damage to lung tissue. Elevated greenhouse gas productions from automobiles, power plants, and other human-caused causes lead to global warming, which raises ozone levels. This pollution can exacerbate respiratory and cardiovascular conditions, including asthma attacks and heart attacks. Ozone is better at altitude but bad close. The ozone level in the upper surroundings protects us from the UV radiation of the sun. On the other hand, breathing in ozone air pollution particulate matter is a serious health danger.

Apart from their direct effects, climate change and extreme weather events alter the biosphere, which has an indirect effect on the quality of the air and water and raises the risk of disease. Damage to the heart, lungs, and other essential organs is brought on by air pollution.

Example for Air pollution impact on human health



**Fig. 2. Example for Air pollution impact on human health**

### 6.3 Water Quality

Impact of climate change on human health. Some common water-related diseases are diarrhea, giardiasis, dysentery, typhoid fever, coli infection, and salmonellosis. Adverse health effects may include pain and other symptoms in the gastrointestinal, reproductive, and neurological systems. Continued exposure can cause long-term health effects. Impure water for purification can cause infectious skin and eye diseases such as trachoma<sup>(12)</sup>. Outcomes on human

health increasing flows are accompanied with decreased flows and greater temperatures. Reduced water levels in rivers, lakes, and streams result from periodic droughts and rainfall patterns, which reduces the amount of water available for removing pollutants. Furthermore, whole water sources may be damaged or contaminated during disasters, increasing the danger of cholera and typhoid, especially in young people. Err. Raising temperatures have the potential to contaminate freshwater supplies with deadly bacteria, making the water unsuitable for human use.

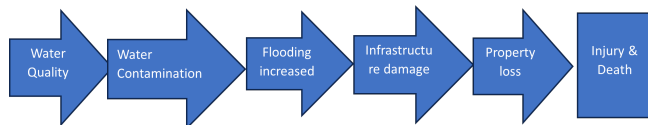


Fig. 3. Example for Water Quality impact to human health

## 6.4 Food Security

The effects of climate change on human health-related disturbances in the food system may have an indirect influence on human health by decreasing food security in Karnataka, an important factor of health. Human health may be immediately impacted by the physical impacts of climate shift on Karnataka's food system, mostly through pathways pertaining to nutrition and food security. This is because food loses nutritional content because of rising temperatures, requiring individuals to eat more to receive the same advantages. Poverty increases because of a producing population, starvation, and yield loss; these factors lessen the effects of environment change and efforts to ameliorate it.

Example:



Fig. 4. Example

## 6.5 Mental Health

Climate Change's Effects on Human Health Karnataka and mental health issues are linked to droughts. The increased frequency of disasters resulting from climate change has been linked to depression, adjustment disorder, Changes in global temperatures may necessitate population shifts, which could accumulate stress because higher temperatures have already been linked to an increase as the temperature rises, there are more violent occurrences and suicide attempts. Climate disasters, mental health research, and other elements that are detrimental to mental health are less common in colder climates. Survey participants' mental health problems varied

according to the intensity of the pandemic, and people living in neighborhoods with more severe cases of somatization, sadness, and anxiety also showed more severe symptoms of these disorders. Social factors that bond and bridge social capital, as well as healthy and individual-oriented lifestyles, mediate the impact of socioeconomic status and taken together, these social factors collectively reduce the negative impact on mental health. It has been found that socioeconomic status is both directly and indirectly related to depression, anxiety, and somatization<sup>(13,14)</sup>.

Example for Mental health impact on human health

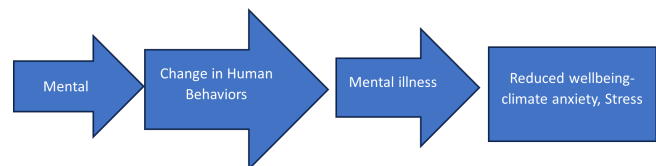


Fig. 5. Example for Mental health impact on human health

## 7 Summary

Climate affects wellbeing in Karnataka rising rates of malnutrition and associated illnesses like childhood stunting, with the impoverished probably suffering the most effects. By 2050, stunting of children is expected to rise by 35% when compared to a world without climate change. Health issues such as heart disease, respiratory disorders, and some cancers can be brought on by exposure to environmental contaminants<sup>(15)</sup>. Walking outdoors improves your emotional and physical health by lowering heart rate, blood pressure, muscle tension, and the release of stress chemicals. According to specialists, it might even lower mortality in areas like human health. Our surroundings physical, chemical, and biological<sup>(8)</sup>. There are two categories of consequences that climate change has on human health: direct effects and indirect effects. Changes in extreme weather and the ensuing rise in storms, floods, droughts, heat waves, and wildfires are examples of direct mechanisms or dangers. Risks that are mediated indirectly include variations in the biosphere, the burden of disease and the movement of disease-carrying organisms, as well as changes in food supply, water quality, air pollution, land use, and ecology. Floods are predicted to grow more severe in the future due to an increase in heavy rainfall events. Rainfall and flooding interact in a complex way. Flooding is predicted to become less common in some areas. More potential for vector reproduction and the spread of infectious diseases is created by stronger hurricanes. Stronger winds are a sign of extreme weather. These winds could transport vectors over tens of thousands of km, bringing new infectious pathogens to previously uninfected areas. Numerous aspects related to droughts are impacted by climate change, including the amount of rain that falls and the pace at which it evap-



orates. Droughts are becoming more severe and frequent in many sections of the world for the global warming. The likelihood and activity of wildfires increase with climate change. Warming ground temperatures brought on by climate change result in earlier snowmelt dates, drier-than-expected vegetation, more probable fire days, a higher frequency of summer droughts.

Infectious illness outbreaks have grown in response to global climate change. The spread of infective diseases that are affected by climate change include dengue fever, malaria, leishmaniasis, zika fever, chikungunya, and Ebola virus disease, which are spread by vectors. The fact that climate change is affecting the seasonality and geographic limit of the insects, or disease vectors, that can spread the diseases, is one of the factors for increasing disease transmission. In 2022, scientists made the following unambiguous observation: "the prevalence of climate-related food-borne and waterborne diseases. Climate change affects many aspects of food security through "multiple and interconnected pathways." Many of these, including crops that fail due to more common and difficult weather events, are related to how climate change is influencing agriculture. This is in addition to several other ongoing challenges that reduce food security across the board. A decrease in food security raises the risk of undernutrition and all the health problems that go along with it. Changes in impressive carbon dioxide can cause certain crops, like wheat, to lose some of their protein and mineral content. The outcomes of storms with higher frequency and intensity were excluded. The study assessed the death rate among the elderly due to heat exposure, the rise in dengue, malaria, diarrhea, coastal flooding, and undernutrition in children.

## 8 Suggestions

Following suggestions are made from the above analysis:

- It is suggested to the Policy makers to formulate suitable policies by consulting the environmental scientists to promote a greener environment.
- It is suggested to the Government to make it compulsory to grow plants and trees whenever there is construction of residential houses, commercial buildings, etc.
- It is essential to avoid the industrial and power projects that can destroy the forests.
- It is needed to grow trees at both the sides of roads to protect the environment and ensure safety and well-being of people.

## 9 Conclusion

Its long-term goal is to establish a state-wide healthcare system that is resilient to climate change. The public, health professionals, policymakers, etc. should be made aware of

human health issues, health capacity should be strengthened, health readiness should be prioritized, and governmental and non-governmental partnerships should be developed and strengthened. Climate change may have a variety of effects on human health then disease, in addition to other natural and man-made stressors. There will be an increase in certain current health hazards as well as the emergence of new ones. Not everybody is in the same danger. Age, financial standing, and location are crucial factors. Farmers' health may be impacted by the physical, biological, and environmental disruption caused by humans in Karnataka. Changes in food distribution and geographic distribution, an increase in respiratory and cardiovascular disorders, accidents and early fatalities linked to extreme weather proceedings, and water-borne diseases are some of the human health effects of those disturbances.

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