# EFFECT OF CLIMATIC CHANGE ON HUMAN HEALTH ANDITS NEGATIVE IMPACT ON ECONOMICAL CONDITION OF COUNTRY

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## ABSTRACT

Climate change is a global challenge which is likely to affect the mankind in different ways. Climate change not only expected to affect physical health but also mental health of human population from different parts of world. Increasing temperatures presumably will increase rates of aggression and violent suicides. Where as droughts due to climate change can lead to more and more economical losses which might further effects on farmer ‘s health . Increased frequency of disasters with climate change can lead to stress relevant disorder, and depression. Changes in climate and global warming may require population to migrate, which can lead to different cultural assimilation.It can also lead to increased rates of physical illnesses, which would be associated with psychological distress as well as overall health of human population and economical disaster of country in general.

**Keywords;** Climate change, distress, farmer suicide, global warming, mental health

## INTRODUCTION

Climate change refers to relatively stable changes in the meteorological parameters like precipitation and temperature over a period of time in a given region. Such a climate change has been described as a critical global challenge( Lin et al., 2008 ). Due to the fact that human activities have been contributory to changes in global climate. It has been observed that over least few decades the average global temperature has risen by 0.5°C due to anthropogenic emissionsand projections for 2100 AD suggest that average global temperatures will rise by 2.4–5.8°C (Kjellstrom and Crowe 2011). .Such gradual increase in temperatures is likely to be associated with melting of ice caps, submergence of coastal areas, adverse precipitation events, and floods and droughts in different regions. Such change in climate on a global scale is likely to affect the mankind in many different ways. The effect of global climate change is likely to be more severe in developing countries ( Linkowski et al., 1992) )Attention has been drawn to the variety of health impact of climate change. Global climate change is likely to be associated with spread of vector borne diseases, injuries and deaths due to extreme weather conditions such as floods, storms, and cyclones, thermal injury due to exposure to heat, risk of spread of water-borne infections due to floods and coastal water warming, and reduction in regional crop yields leading to malnutrition ( Lipp et al., 2002 ).The impact of global climate change on health is likely to be substantial. Mental health comprises an important component of health and is also likely to be affected by global climate change. The present narrative review discusses the mental health impact of global climate change from the point of view of a developing country (Maes et al., 1994 ).

**Effect of environmental temperature on health**

Increased exposure to heat is likely to become more common with the rise in the global temperatures. It has been suggested that there is a relation between temperature rise and aggressive behavior.Increase in rates of criminality and aggression have been observed during the hot summer months, suggesting a link between aggressive behaviors and temperatures ( (Epstein and Moran 2006). ).With global warming, it is possible that the rates of aggression may increase over time. Association has been also been seen with the rates of suicides and the temperatures (( Anderson , 2001). It has been seen that suicides, especially violent ones are more common with the recent increase in temperatures( (Berry et al., 2010). Heat waves have been associated with mental and behavioral disorders. A study from Australia suggests that heat waves are associated with increased rates of admissions for mental disorders also, in conjunction with other disorders such as cardiovascular and renal illness ( Cohn et al., 2004) )Such heat waves have been associated with mood disorders, anxiety disorders, dementia and anxiety related disorders among others .Extreme heat exposure can lead to physical as well as psychological exhaustion .A study from Thailand suggests that occupational heat stress is associated with greater psychological distress among the workers.Similar other studies have found an association between increased temperatures in the work place and greater psychological distress (Desalvo et al., 2007).

**Psychological consequence due to climate Change**

Climate related disasters such as floods, hurricanes, and bush-fires are often associated with stress-related psychiatric disorders. Individuals who have been exposed to life threatening situations are at a considerable risk of developing posttraumatic stress. The symptoms of stress includes flashbacks of

the event, increased arousal and avoidance of cues to the memory of the event ( (Majra and Gur ,2009 ).Other stress exacerbated disorder includes development of acute and transient psychosis and relapse of bipolar disorder. Faced with the loss of home, environment, social structures and loved ones, an individual may develop a bereavement or depression (Desalvo et al., 2007). The depression is likely to be more pronounced in those who live in small rural communities, than those living in big cities. The impact of climate change seems to be increasing over the time period, it is likely that a greater proportion of the population would be impacted by the mental health consequences of climate change related disasters( Mendelsohnet al., 2006).

## Drought and farmer health

Global climate change is likely to exacerbate droughts in the years to come. The change in precipitation patterns are likely to lead to increased floods in some areas while prolonged droughts are expected in other areas. A relationship has been found between the occurrence of drought and farmer suicides. Such a trend has not only been found in developed country like Australia, but also in developing the country like India ( (McMillen et al., 2002). Association has been found between crop failures due to unexpected droughts and suicide attempts in the farmers. Failure of crop can lead to economic hardships. When dependent on low precipitation situations, the farmer might not be able to sustain the expenses of the family and may become a victim of the debt trap to meet the expenses. Second, it may also lead to rise in expenses of food and other goods in the region. Inability to make basic purchases can lead to malnutrition and risk of other infections, especially in developing countries where structural social services are not efficiently organized. Third, droughts are also often associated with prolonged exposure to warm, dry season( Michael et al., 2006 ) . It seems likely that exposure to heat can lead to increased rates of suicide attempts. Fourth, prolonged droughts can lead an individual to migrate to another region and/or pursue another vocation. This leads to acculturation stress which

may further lead to suicide attempts in the farmer population. Since much of the world population depends on the farmers for their food supply, health care of the farmers is an important issue and efforts are required to provide help to them when needed. Moreover, since the majority of the farmers live in rural areas while healthcare facilities are concentrated in urban areas, efforts are required for easy access to services to this population ( Nitschke et al., 2011).

## Climatic change economical losses and human health

Societies dependent on agriculture are likely to be quite impacted by the changing climate. Agricultural land may be encroached upon by rising sea levels, desiccation or flooding. Moreover, extreme heat makes agricultural work less productive due to fatigue of the workers( Pandve , 2008).Decreasing agriculture produce also hampers the production in agricultural support industries which also employ the manual laborers during the lean season. These can lead to economic hardship which can result in an increase in mental health problems. It has been observed that drought prone areas are vulnerable to lower socioeconomic status and higher levels of distress and helplessness. Long duration droughts have been associated with deterioration of economic conditions, which has been associated with depression and demoralization ( (Pilkey and Cooper 2004 ).Distress due to prolonged droughts have been found in adolescents and have been seen to increase with time .Social capital which combines social cohesion and community participation is strained under economic pressure situations( Trenberth , 2001 ).Decrement in social capital can lead to a reduction in wellbeing and may influence genesis of mental health problems. Women are more likely to be affected than men with the reduction of social capital especially when they have to migrate for employment or other reasons.

Economic constraints can also have an adverse impact of healthcare seeking, especially for mental health. The ability of the society to provide treatment may be reduced during periods of economic hardships. Individual's payment for treatment, which is the more common mode of payment of treatment in developing countries, can be affected due to economic adverse situations, leading to inadequate treatment opportunities and suboptimal treatment ( Tawatsupaet al., 201 ).

## Migration and stress

Climate change is likely to be related to changes in habitat and ecosystems all over the world. Submergence of coastal areas, hurricanes and floods, and prolonged droughts are likely to be associated with migration of population, regionally and internationally. Previous mental health literature suggests that migration of individuals is related to acculturation stress, which is likely to act in the genesis of psychiatric disorders ( Zhou et al., 2004 ).For example, migrants are more likely to suffer from schizophrenia than the host population or the population of their origin. It has been suggested that the reasons of migration also influence the propensity to develop psychological problems in individuals. Those individuals forced to migrate after strife and disasters are more likely to suffer from psychiatric illness as compared to those individuals who choose to migrate voluntarily (Nitschke et al., 2011).

## Association of climate with physical illnesses

Mental health is intricately linked with physical health. Poor physical health and ailments can lead to poor quality of life and psychological distress ((Michael et al., 2006 ).Often the

psychological distress elicited by medical illnesses do not qualify for a severe psychiatric illness but require the diagnosis of adjustment disorders. Nonetheless, the anxiety and depressive symptoms generated as a consequence of physical illness require attention and are helped with treatment with antidepressants and counseling.It is rarely in doubt that many physical illnesses would see increasing trends with climate change. Heat, drought, and flood related events are likely to be associated with increased rates of cardiovascular disorders, respiratory, gastrointestinal disorders, and renal problems. Environmental determinants such as pollen, smoke, dust, and a stagnant water consequent to heat, drought-related fires, and floods are likely to adversely affect human health and lead to chronic physical diseases ( Pandve , 2008 ).

Climate change is also expected to lead to decrement in the overall arable land. This is likely to lead to a shortage in food supply if methods of boosting food productivity are not found. Malnutrition especially among children is likely to be exacerbated in developing countries if adequate food supply cannot be ensured with climate change. Nutritional deficiencies are likely to be associated with mental health problems like depression and cognitive decline( (Pilkey and Cooper 2004 ).

Adaptation and mitigation measures aim to make individual adept to the changing environment and attempt to reduce environmental change in the future, respectively. Such measures by themselves may lead to change-related mental health risks through various causal pathways. For example, adaptation to the work situation can have some risks to mental health. For places which do not have air-conditioners, increase in ambient temperatures might lead to decreased productivity in the day time when the temperatures are high. For workers who are paid subsistence rates in developing countries, avoidance of work in excess heat may result in reduced

incomes and growing poverty ( Trenberth , 2001 ). If they attempt to compensate with extending their work hours or at night, it may impair their family and social relations, leading to reduced buffer for development of mental illness. Similarly, traveling between continental cities through trains and buses for the purpose of work may reduce the carbon emissions due to airlines. However, it may result in time expense and less actual time for the business purpose. This might also mean greater time spent on travel which could have been rather utilized with other family members or friends, or for cultivating recreation. Having lesser time for social interaction in a familiar and desirable situation is likely to have an impact on mental health secondarily ( Tawatsupa et al., 2010 ).

## How to over come challenges

Since climate change is likely to impact human mental health in many ways, it is imperative that some steps are taken to either reduce the global warming with time or develop measures to deal with the challenges posed through adaptation. Mitigation of greenhouse gases involves less reliance on fossil fuels, developing and using alternate efficient power sources, reducing encroachment on green cover and other similar measures. There is a developing global perspective about the need to reduce the carbon footprint per person over the next few decades, and to cover the inequities between the rich and the poor countries (Zhou et al., 2004). Countering the challenge of climate change requires inter-sectoral and international collaboration to implement policies for reducing the emission of greenhouse gases ( Pilkey and Cooper 2004 ).

Promoting positive mental health is another way to mitigate the psychological distress due to climate change. Human resilience and coping can reduce the effect of mental health stress due to climate change( Trenberth , 2001 ). Utilization of strategies like yoga can be indigenous and acceptable ways to deal with stress. To reduce suicide fatalities due to secondary consequences of climate change may include debt-abolition or economic support for farmers. Creating co-operatives and protection of farmers from loan sharks might reduce the suicide rates due to crop-failures. Furthermore, provision of subsidies and guaranteed income during the drought seasons might lead to less economic and psychological stress on farmers in question.In response to climate change can have many viewpoints. It might be probably useful to amalgamate the best from different solutions to provide a coherent, implementable and effective response to the concerns raised by climate change. The solutions would be best refined with the systematic evidence accumulated over the course of time (Michael et al., 2006).

## Conclusion

Climate change is likely to affect mental health in many ways. Droughts, floods, rising sea level, increasing ambient temperatures and other consequences of climate change can produce increasing psychological distress through many mediators. These mediators include economic strain, migration and acculturation stress, lowering social capital, and traumatic events among others. Efforts to increase access to mental health services and attempts to mitigate the climate change with time would be appropriate responses to deal with the challenge of climate change in the time to come.

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