

Impact of Climatic Changes on Certain Circumstances of Human Life in India***Dr. Lokesh Kumar*******Dr. Venu Trivedi****

Abstract: - *Changes in the Earth's climate may affect public health, agriculture, water supplies, energy production and use, land use and development, and recreation. The nature and extent of these effects vary regionally and over time. This Paper looks at some of the ways that climate change is affecting human health and society. Changes in climate affect the average weather conditions to which we are accustomed. These changes may result in multiple threats to human health and welfare. Average temperatures will continue to lead warmer days and more frequent and longer heat waves, which could increase the number of heat-related illnesses and deaths. Increases in the frequency or severity of extreme weather events, such as storms, increase the risk of dangerous flooding, high winds, and other direct threats to people and property. Warmer temperatures also reduce air quality by increasing the chemical reactions that produce smog, and, along with changes in precipitation patterns and extreme events, could enhance the spread of some diseases. In addition, climate change could require adaptation on larger and faster scales than in the past, presenting challenges to human well-being and the economy. The more extensively and more rapidly the climate changes, the larger the potential effects on society. The extent to which climate change affects different regions and sectors of society depends not only on the sensitivity of those systems to climate change, but also on their ability to adapt to or cope with climate change. Populations of particular concern include the poor, children, the elderly, those already in poor health, the disabled, and indigenous population.*

Introduction: -India occupies 2.4% of the global land area, supports 17% of the global population and contributes less than 4% of global greenhouse gas emissions. Impacts of climate changes are likely to be felt most acutely not only by the poor, but also by certain segments of the population, such as the elderly, the very young, the powerless, indigenous people, and recent immigrants, particularly if they are

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linguistically isolated, that is, those most dependent on public support. Impacts will also differ according to gender.

Climatic change is the subject of how weather patterns change over decades or on a long time. Climate change takes place due to natural and human influences. Since the Industrial Revolution (i.e., 1750), human beings have contributed to climate change through the emissions of GHGs and aerosols, and through changes in land use, resulting in a rise in global temperatures. Increases in global temperatures may have different impacts, such as an increase in storms, floods, droughts, and sea levels, and the decline of ice sheets, sea ice, and glaciers.

Climatic change is projected to have severe adverse impacts on India's population, natural eco-system, and socio-economic parameters. India's vulnerability to climate change impacts is profound since around 650 million Indians are dependent on rain-fed agriculture for their livelihoods; around 250 million Indians live along a 7500 km of coastline that is at high risk due to sea level rise and extreme weather events; many of the 10,000-odd Indian glaciers are receding at a rapid rate; and deforestation is happening.

Climate change in IPCC usage refers to a change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period. It refers to any change in climate over time, whether due to natural variability or as a result of human activity. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods.

The health status of millions of people is projected to be affected through, for example, increases in malnutrition; increased deaths, diseases and injury due to extreme weather events; increased burden of diarrheal diseases; increased frequency of cardiorespiratory diseases due to higher concentrations of ground-level ozone in urban areas related to climate change; and the altered spatial distribution of some infectious diseases. The climate change is projected to bring some benefits in temperate areas, such as fewer deaths from cold exposure, and some mixed effects such as changes in range and

transmission potential of malaria in Africa. Overall, it is expected that benefits will be outweighed by the negative health effects of rising temperatures, especially in developing countries. The change in stratospheric ozone and corresponding change in Ultra violet radiation over the years are correlated with eye diseases. Critically important will be factors that directly shape the health of populations such as education, health care, public health initiatives, and infrastructure and economic development.

The Problem: - Our personal health may seem to relate mostly to prudent behaviour, hereditary, occupation, local environmental exposures, and health-care access, but sustained population health requires the life supporting services of the biosphere. Populations of all animal species depend on supplies of food and water, freedom from excess infectious disease, and the physical safety also comfort conferred by climatic stability. The world's climate system is fundamental to this life support. Changing climate is likely to affect all these conditions and hence have a powerful impact on human health and wellbeing.

Objective of the Study: - to study impact of climatic changes on human health.

Methodology: - Present study based on secondary data and analyzed the impact and effects of the climatic changes on human being. Secondary data has been used and analyzed for drawing inferences. Data has been collected from documented literature, research reports, statistical documents, magazines, referred books, research journals and internet etc.

Cases of Various Disease and Deaths in India and Madhya Pradesh :- There is a high incidence of occurrence of vector borne diseases like Malaria, Kala-azar, filaria, Chikungunya etc., in the immediate past. It is observed that changes in climatic patterns may alter the distribution of vector species and increase its spread in new areas. An increase in temperature and relative humidity may cause the transmission of different type of diseases in an area. Deaths due to heat wave are reported from several parts of the country from time to time, particularly during the summer. Cases of Various Disease and Deaths in India and Madhya Pradesh during the years from 2011 to 2015 are as follows: -

Table 1.1

Cases of Various Disease and Deaths in India and Madhya Pradesh

Disease	Years	2011		2012		2013		2014		2015	
		Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
Malaria	India	1310656	754	1067824	519	881730	440	1102205	561	482378	151
	M. P.	91851	109	76538	43	78260	49	96879	26	17760	4
Dengue	India	18860	169	50222	242	75808	47587	53128	137	9874	25
	M. P.	50	0	239	6	1255	9	2131	13	42	0
Chikungunya	India	20402	-	15977	-	18840	-	16049	-	10317	-
	M. P.	280	-	20	-	139	-	161	-	29	-
Cholera	India	2341	10	1583	1	1130	5	969	5	-	-
	M. P.	0	0	12	0	8	0	17	0	-	-
Diarrhea	India	10231049	1269	11701755	1647	11413610	1629	1173018	1223	-	-
	M. P.	290705	92	488743	91	535012	89	768021	112	-	-
Typhoid	India	1062446	346	1477699	428	1650145	387	1707312	429	-	-
	M. P.	32490	20	68280	29	114578	28	155197	31	-	-

Source- Statistics Related to Climate Change – India 2015

The data shown in the table reflects facts about deaths and cases due to various disease in Madhya Pradesh and India during the period 2011 to 2015. There were found cases and deaths due to three major disease namely Malaria, Diarrhea and typhoid in a large number both Madhya Pradesh and India. In India deaths and cases of malaria have been decreased and typhoid cases and deaths are increasing. Madhya Pradesh has same condition for malaria and typhoid. The cases and deaths due to dengue are increasing in Madhya Pradesh and also in India, and other disease cholera and chikungunya are decreasing during the period. Central government as well as state government have taken initiatives to improve health facility for the poor and socio-economically downtrodden people so that the cases and deaths due to these diseases have been decreased in country and state.

Distribution of Deaths by Natural Disaster: -Various causes have been identified for analyzing the patterns of deaths by natural disaster in the country. Cause wise details of deaths by natural disaster, rate and its percentage variation during 2015 over 2011 are presented as follows: -

Table 1.2
Distribution of Deaths by Natural Disaster in India 2011-2015

Years	2011		2012		2013		2014		2015	
	Deaths	%	Deaths	%	Deaths	%	Deaths	%	Deaths	%
Avalanche	60	1.07	40	0.72	52	0.83	23	0.38	38	0.52
Cold and Exposure	849	15.10	997	17.86	946	15.09	913	14.92	1149	15.64
Cyclone/tornadoes	117	2.08	47	0.84	52	0.83	104	1.71	28	0.38
Earthquake	69	1.23	3	0.05	9	0.14	2	0.03	92	1.26
Epidemic	127	2.26	80	1.43	57	0.91	48	0.78	218	2.96
Flood	585	10.41	420	7.52	700	11.16	541	8.84	846	11.52
Heat Stroke	793	14.11	1247	22.34	1216	19.39	1248	20.41	1908	25.96
Landslide	302	5.37	282	5.05	264	4.21	499	8.16	232	3.16
Lightening	2550	45.36	2263	40.54	2833	45.18	2582	42.21	2641	35.95
Torrential	170	3.02	203	3.64	142	2.26	156	2.56	195	2.65
Total	5622	100.0	5582	100.0	6271	100.0	6116	100.0	7347	100.0

Source- Source: National Crime Record Bureau, Ministry of Home Affairs (GOI)

Attributable to Forces of Nature', the share of deaths due to 'Avalanche', 'Exposure to Cold', 'Landslide', 'Torrential Rain' and Heat/Sun Stroke' has increased during the year over the previous year 2015 whereas the share of causes such as 'Earthquake', 'Starvation due to Natural Calamity', 'Flood', 'Epidemic' and 'Lighting' has decreased in 2015 over 2011.

Damage Due to disaster in the county: - During the years from 2010-11 to 2015-16, various States and Union Territories have reported damages due to cyclonic storms/ flash flood/ floods/ landslides/ cloudburst etc. in varying degrees. Extent of damage in the country (provisional) during the year is as follows: -

Table 1.3
Year Wise Damage Caused Due to Floods, Cyclonic Storms, Landslides

Year	Live Lost Human (in no)	Cattle Lost (in no)	Houses Damage (in no)	Cropped Affected (In Lakh ha)
2010-11	2310	48778	1338619	46.25
2011-12	1600	9126	876168	18.87
2012-13	948	24360	671761	15.34
2012-14	5677	102998	1210227	63.74
2014-15	1674	92180	725390	26.72
2015-16	1460	59057	1313371	31.09

Source- Ministry of Home Affaire (MHA)

Climatic change could result in the biggest health problems of the 21st century. Nevertheless, health hardly plays a role in the international climate negotiations. At the same time, there is new evidence to support mitigation of climate change, not only for climate but for health reasons as well. Many interventions that reduce greenhouse emissions produce considerable and immediate health “co-benefits”. This is not just due to a reduction in classical greenhouse gases – which are not toxic by themselves – but due to a reduction in coincidental short-lived emissions. It is the latter that have direct negative effects on health. Their reduction therefore results in immediate health improvements. In addition, many preventive health interventions have as a “side effect” substantial climate change mitigation. Because of the negative health consequences of climate change and because of the positive health effects of mitigation, health interventions need to become a much more prominent issue in the international climate discussion. The health sector and health professionals have a special responsibility to emphasize these interdependencies – a responsibility which as yet is hardly taken seriously.

The major brunt of global climatic change on health: -The major brunt of global climatic change in terms of adverse health impact will be mostly borne by the poor and developing countries, even though the rich and industrialized countries account for maximum greenhouse gas emission. Though India has contributed only 2 per cent of the

total carbon emissions from fossil fuel burning over the last 100 years, still it is likely to experience greater effects from the 'extreme weather' events. Major health effects due to changing climate can be broadly classified as follows:

1. Extreme weather-related health effects.
2. Air pollution-related health effects.
3. Water and food-borne diseases.
4. Vector-borne diseases.
5. Effects of food and water shortages.
6. Psycho-social impacts on displaced populations.
7. Health impacts from conflicts over access to vital resources.

Therefore, impacts of climate change on health can be summarized as:

1. Climate change leads to changed disease pattern and mortality.
2. Climate change impact will hit all the species and living being.
3. Impact will hit population in all the countries by various factors only the intensity will vary.
4. Climate change will affect most fundamental prerequisites of health, food, water and air.
5. Climate change influences the human settlements, migration, displacement and eating patterns, food habits resulting in malnutrition, injury, conflict and infections etc.
6. Rising sea level, extreme events may threaten coastal communities for survival and migration.
7. Fresh water scarcity risk may be more acute in coming times leading to related health problems and deaths.
8. Changing weather patterns are already impacting food production and species migration and will further affect with more severity ultimately affecting human health and survival.
9. Climate change will have adverse effects on economic growth and ultimately affecting health.
10. Climate change influences the resurgence of disease organisms and vectors. Number of diseases may be exacerbated by climate change like, water borne disease, food

borne disease, vector borne disease, diabetes, hypertension, obesity, food borne disease, respiratory disease etc.

Therefore, climate change can affect human health both directly and indirectly. The impacts of climate change on health could be direct in the form of increasing mortality from extreme temperature and weather events, and also indirect in the form of changes in ecological and socio-economic systems such as transmission of vector-borne diseases, changes in agricultural productivity, malnutrition etc. Communicable diseases such as malaria have been prevalent over the years and it is becoming harder to control the vector because of development of insecticide-resistant strains. Malaria is currently most endemic in South and South-East Asia, but there are concerns that it may spread due to changing climate, urbanization, irrigation, changing agricultural practices, and deforestation.

Global climate changes may adversely affect mortality and morbidity rates through the general warming. Rich countries produce most of the world's greenhouse gases, but it is the health of people in poor countries that suffers the most from global warming. The World Health Organization estimates warming and precipitation changes due to climate change claim 150,000 lives every year. The WHO warns that the risk of death and disease from climate change will double in the next 20 years. Thus, global warming is no longer an environmental problem, but has become a threat to public health. Diseases such as malaria, yellow fever, dengue and cholera are all sensitive to climate change. Many are spread by insects like mosquitoes, which prefer a wetter, warmer world. Deaths from heart diseases and respiratory illness during heat waves and malnutrition from crop failures add to the toll.

Due to growth in population in last few decades together with the rapid growth in industry and consequent higher energy consumption, there has been depletion of forest cover for converting into agricultural land, encroachment for settlement and increased harvesting of forest for biomass fuel. Similarly, in developing country such as India, rapid population growth, industrialization, increased energy consumption and degrading air and water quality may lead to major health impacts due to resulting climate change.

Increase in temperature, precipitation and extreme events are predicted to have an effect on the viability and the geographical distribution of the mosquitoes that transmit malaria. The Global warming is anticipated to increase the mosquito survival rates especially in temperate areas. In developing countries like India, rapid population growth and low incomes have resulted in large scale rural urban migration resulting in chaotic and unplanned urbanization. Besides, the combustion of fossil fuel and biomass will continue to be the dominant source for energy in India even in late 21st century. The combustion of these fuels result in the emission of such as CO₂, CO, NO, SO₂, hydrocarbons, etc. The exposure to these pollutants can have a wide range of health effects. In metropolitan cities, such as Delhi, with increase in the number of vehicles and subsequent release of pollutants because considerable damage is caused to the respiratory system. Complex effects such as bronchitis, pulmonary edema, chronic bronchitis, cancer and eye related diseases are reported at higher doses.

Conclusion: -India is home to a third of the world's poor, and climate change will hit this section of society the hardest. Set to be the most populous nation in the world by 2045, the economic, social and ecological price of climate change will be massive. With changes in key climate variables, namely temperature, precipitation and humidity, crucial sectors like agriculture and rural development are likely to be affected in a major way.

Because of increasing consumption of fossil fuels, we are today, the fourth largest emitter of greenhouse gases worldwide. Although our per-capita emissions are among the lowest in the world, our growth rates imply that the past is no predictor of the future. The most recent IPCC report suggests that India will experience the greatest increase in energy and greenhouse gas emissions in the world, if it sustains a high annual economic growth rate. The International Energy Agency predicts that India will become the third largest emitter of greenhouse gases by as early as 2015. India imports large quantities of fossil fuels to meet its energy needs, and the burning of fossil fuels alone accounts for 83% of India's carbon dioxide emissions. Nearly 70% of our electricity supply comes from coal. Impacts are already being seen in the form of unprecedented heat waves, cyclones, floods, salinization of the coastline and these have effects on agriculture, fisheries and health.

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