

International Multidisciplinary
Research Journal

*Indian Streams
Research Journal*

Executive Editor
Ashok Yakkaldevi

Editor-in-Chief
H.N.Jagtap

Indian Streams Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial board. Readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

Regional Editor

Dr. T. Manichander

Mr. Dikonda Govardhan Krushanahari
Professor and Researcher ,
Rayat shikshan sanstha's, Rajarshi Chhatrapati Shahu College, Kolhapur.

International Advisory Board

Kamani Perera Regional Center For Strategic Studies, Sri Lanka	Mohammad Hailat Dept. of Mathematical Sciences, University of South Carolina Aiken	Hasan Baktir English Language and Literature Department, Kayseri
Janaki Sinnasamy Librarian, University of Malaya	Abdullah Sabbagh Engineering Studies, Sydney	Ghayoor Abbas Chotana Dept of Chemistry, Lahore University of Management Sciences[PK]
Romona Mihaila Spiru Haret University, Romania	Ecaterina Patrascu Spiru Haret University, Bucharest	Anna Maria Constantinovici AL. I. Cuza University, Romania
Delia Serbescu Spiru Haret University, Bucharest, Romania	Loredana Bosca Spiru Haret University, Romania	Ilie Pintea, Spiru Haret University, Romania
Anurag Misra DBS College, Kanpur	Fabricio Moraes de Almeida Federal University of Rondonia, Brazil	Xiaohua Yang PhD, USA
Titus PopPhD, Partium Christian University, Oradea,Romania	George - Calin SERITAN Faculty of Philosophy and Socio-Political Sciences Al. I. Cuza University, IasiMore

Editorial Board

Pratap Vyamktrao Naikwade ASP College Devrukh,Ratnagiri,MS India	Iresh Swami Ex - VC. Solapur University, Solapur	Rajendra Shendge Director, B.C.U.D. Solapur University, Solapur
R. R. Patil Head Geology Department Solapur University,Solapur	N.S. Dhaygude Ex. Prin. Dayanand College, Solapur	R. R. Yalikal Director Managment Institute, Solapur
Rama Bhosale Prin. and Jt. Director Higher Education, Panvel	Narendra Kadu Jt. Director Higher Education, Pune	Umesh Rajderkar Head Humanities & Social Science YCMOU,Nashik
Salve R. N. Department of Sociology, Shivaji University,Kolhapur	K. M. Bhandarkar Praful Patel College of Education, Gondia	S. R. Pandya Head Education Dept. Mumbai University, Mumbai
Govind P. Shinde Bharati Vidyapeeth School of Distance Education Center, Navi Mumbai	Sonal Singh Vikram University, Ujjain	Alka Darshan Shrivastava Shaskiya Snatkottar Mahavidyalaya, Dhar
Chakane Sanjay Dnyaneshwar Arts, Science & Commerce College, Indapur, Pune	G. P. Patankar S. D. M. Degree College, Honavar, Karnataka	Rahul Shriram Sudke Devi Ahilya Vishwavidyalaya, Indore
Awadhesh Kumar Shirotriya Secretary,Play India Play,Meerut(U.P.)	Maj. S. Bakhtiar Choudhary Director,Hyderabad AP India.	S.KANNAN Annamalai University,TN
	S.Parvathi Devi Ph.D.-University of Allahabad	Satish Kumar Kalhotra Maulana Azad National Urdu University
	Sonal Singh, Vikram University, Ujjain	

EFFECTS OF CLIMATIC CHANGE ON HUMANITY

Dr. Dhrub Kumar Dwivedi

**Prof. & Head of Department of Geography ,
Rambai College Dabhaura Rewa (M.P.)**

ABSTRACT

The recent studies have established scientific evidences for climate change. Climate change has a number of immediate and long-term impacts on the fundamental determinants of human health. A number of potential human health effects have been associated either directly or indirectly with global climate change. Current international policies and protocols, such as those for sulfur and nitrogen emission reductions would need reassessment. Also, risk assessments for a range of chemicals used in agriculture and silviculture must be re-evaluated. Generally, if the cycling of substances that act on the health of populations, and on the vitality of ecological systems, is not directly sensitive to climate change, these substances may nevertheless be climate change sensitive if they are closely linked to organic compounds in soils and waters. This is because the turnover of organic compounds is directly sensitive to change in meteorological factors. Ministry of Health and Social Welfare is responsible for emergency preparedness, mostly disease outbreaks in the country. However, specific climate changes associated human health issues are poorly addressed in the country. It is therefore important that India prepares itself to appropriately

address climate change impact on human health. It is equally important that policy makers and other stakeholders engaged in a process to update and adapt priorities to mobilize the resources should do interdisciplinary research on climate change and its mitigation.

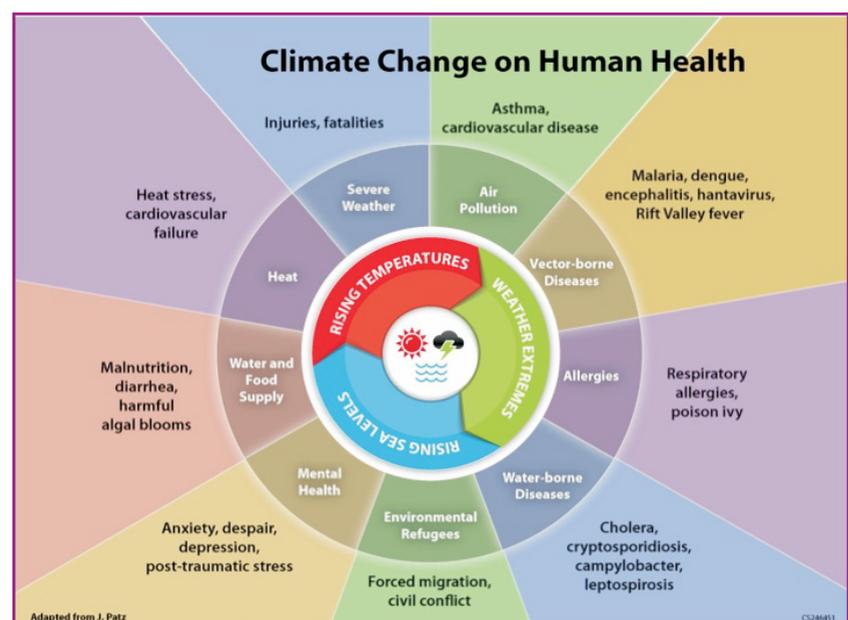
KEYWORDS: Climatic Change , potential human health , global climate change.

INTRODUCTION:

Over the ages human societies have degraded or changed local ecosystems and modified regional climates. Climate change has become one of the most critical global challenges of our times. Globalization

the environmental policy agenda must not divert attention from concerns about unresolved, regional environmental problems. Global warming, albeit with unclear manifestations in regional and local climates, is likely to aggravate impacts from already existing environmental stress including acidification rising troposphere oxidant levels, stratospheric ozone depletion, the flux of heavy metals in soils and waters.

Among the first scientists to analyze these potential problems in some depth was Oppenheimer in the late 1980s. In terms of noticeable awareness raising and policy-making, the issue area was first addressed by the German Parliament in 1989. Impact categories



aggravates climate change. A wide range of climate-forcing substances CO-carbon monoxide, NO_x—nitrogenoxides, CO₂—carbon dioxide, CFCs—chlorofluorocarbons(freons), N₂O—nitrous oxide, halons—CFC-like substancescontaining bromine instead of chlorine, CO- and CH₃CCl₃- various chlorine-containing substances, CH₄—methane, and several more are involved in these interactions, directly or indirectly. Among a multitude of complex linkage contributes to a lower temperature in the stratosphere, the ozone content of which then becomes more prone to destruction by chlorine; because lower stratospheric temperatures provide for an increasing occurrence of polar stratospheric cloud-particles, the surfaces of which interact with the ozone-depletion process. This increases the amount of ultraviolet radiation reaching the earth's ground, in turn leading to increased potential for buildup of photochemical oxidants that can affect forest growth.

Reduced forest growth, in turn, implies a diminished capacity for vegetational uptake of carbon dioxide, which is a greenhouse gas. The greenhouse effect can then increase, leading to further cooling of the stratosphere, and thus to increasing UV-light penetration generating further increases of oxidants that affect forest growth, etc. hence this is an example of the potential for a vicious cycle between climate change, ground near pollution, and natural resources deterioration.

India has been experiencing real and visible impacts of climate change. The latest high-resolution climate change scenarios and projections for India, based on the Regional Climate Modelling system, known as PRECIS, developed by the Hadley Centre and applied for India using IPCC scenarios A2 and B2, show an annual mean surface temperature rise by the end of the century, ranging from 3 to 5°C under the A2 scenario and 2.5 to 4°C under the B2 scenario, with warming more pronounced in the northern parts of India. A 20% rise in all India summer monsoon rainfall and further rise in rainfall is projected over all states except Punjab, Rajasthan, and Tamil Nadu, which show a slight decrease. Extremes in maximum and minimum temperatures are also expected to increase and similarly extreme precipitation also shows substantial increases, particularly over the west coast of India and west central India. Rapid mountain glacier retreat has been documented in the Himalayas, meltwater from the Himalayan glaciers contributing a sizeable portion of river flows to the Ganges, Brahmaputra, Indus, and other river systems Smith (2001). Public health, to a large extent, depends on safe drinking water, sufficient food, secure shelter, and good social conditions. A changing climate is likely to affect all these conditions.

Climate Change is a Physical Process, which depends on the availability and quality of natural resources e.g. air, land, water, biota, and materials. Coastal areas and communities will be amongst the highest at risk because of their proximity to the sea. The direct impacts of climate change will depend largely on the density of human populations and characteristics of settlements on the coastal strip (Lemmen et al. 2008). Average population density along the coastline is relatively low, but high densities occur in coastal cities like Boston, Mumbai, Melbourne, Sydney, Los Angeles, Cape Town, San Francisco and Portland. The Gulf of Maine has a wide range of human settlements and development over its coastline and population density is expected to increase, particularly in areas close to the larger coastal cities over the next 30 years (Pesch and Wells 2004).

The potential impacts of climate change on humanity relate to human well-being, disruption of infrastructure and networks, access to goods and services, and adaptive capacity of communities to deal with the issue. All the potential impacts cannot be classified as negative as there are positive aspects that have been cited below. It is difficult to measure many of the impacts, although some impacts can be evaluated in financial terms.

“Climate science is still evolving. It is difficult to directly attribute one freak weather event to climate change. However, a series of unprecedented freak events, which we have witnessed in the recent past, is certainly due to climate change and global warming,” says Singh. A direct impact of unpredictable monsoon and extreme weather events - and one that hits particularly hard - is the toll it takes on agriculture. WGH paints a dark picture for Indian agriculture, predicting losses of over \$7 billion (around Rs42,749 crore) in 2030. It foresees a 2-14 percent reduction in the yield of monsoon sorghum grain by 2020, with worsening yields by 2050 and 2080 and warns that the Indo-Gangetic Plains are under threat of a significant reduction in wheat yields.

IMPACT OF CLIMATE CHANGE ON HUMAN HEALTH

Our personal health may seem to relate mostly to prudent behaviour, heredity, 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 and comfort conferred by climatic stability. The world's climate system is fundamental to this life support. A changing climate is likely to affect all these conditions and hence have a powerful impact on human health and well-being. Mc Michael (2003). In the Third Assessment Report, the United Nation's IPCC concluded that “climate change is projected to increase threats to human health.” Climate change can affect human health directly (e.g., impacts of thermal stress, death/injury in floods and storms) and indirectly through changes in the ranges of disease vectors (e.g., mosquitoes), water-borne pathogens, water quality, air quality, and food availability and quality. Global climate change is, therefore, a newer challenge to ongoing efforts to protect human health. Some of the current and future health effects include:

Effects

- Increased injuries and deaths due to flooding, high winds, and storms.
- Reduced access to health care due to disruption of services.
- Increased heat--related mortality and morbidity particularly the elderly
- It effect adversely on female fertility.
- Increase in infectious diseases due to flooding and increase in damp conditions.
- Exposure to chemicals from damage and overflow from pipelines and other storage utilities.
- Increase in disease vectors resulting from temperature and precipitation shifts.
- Anxiety, stress and other mental health problems due to heat, flooding and storm events, as well as possible evacuation or migration.
- Increased risk of social unrest, crime and violence.
- Increased risk of exposure to fires, chemical spillages, electricity.
- Loss of land along the coastline and riparian areas for multiplicity of purposes (e.g., housing, agriculture, recreation).

One study estimates that one meter rise in sea level will displace about 7.1 million people in India as the villagers of Rewa, Singrauli village in Madhya Pradesh.

- Increased costs of land preparation to prevent flooding along coastline and riparian areas.
- Threat of access to potable water due to saline intrusion of freshwater aquifers.
- Threat of access to potable water due to contamination of water supplies and disruption of treatment works and supply infrastructure.
- Risk of sewer overflows.
- Loss of riparian and coastal land area suitable for agriculture.
- Reduced availability and increased cost of agricultural (animal, dairy and vegetable) products due to wet weather and flooding.
- Reduced availability of fish/shellfish due to water quality.
- Damage and loss of buildings and property during floods and storms.
- Increased cost of housing in coastal areas.
- Employment and business opportunities in sustainable construction and design.
- Disruption to electricity supplies during weather events.
- Outages of production lines for manufacturing.
- Disruption of transport and communication networks.
- Increased costs for establishing and maintaining business facilities and operations in sensitive areas.
- Increased costs of insurance.
- Opportunities for new technology and business.
- As the world's oceans rise, low-lying coastal areas will disappear. Flooding of coastal areas will become more common and more severe as storm surges have easier access to these lower-lying areas. The occurrence of extreme highwater events related to storm surges, high tides, surface waves, and flooding rivers will also

increase.

- There is a scientific consensus that climate change is occurring, and that human activities are the primary driver. Evidence of climate change includes the instrumental temperature record, rising sea levels, and decreased snow cover in the Northern Hemisphere, loss of bio-diversity, generating new illness, land and soil degradation, agricultural seasons changes, rain cycle disrupted, increased intensity of cyclones, coastal areas merging into sea/oceans, rise in sea level etc. increase in mortality and morbidity. Besides, some positive effects like coconut production may increase and some marine fisheries likely to have higher catch compared to others.
- A glacier is a mass of ice consisting of compacted and re-crystallized ice on land that flows down under its own weight due to gravity. Glaciers are lying largely or wholly on land and showing evidence of past or present movement. Snowfields that persist through the summer melt season are not glaciers because they lack motion. Presently, glaciers cover nearly 15 million km² or about 10 % of land surface and contain 2.15 % of all water on Earth.
- Biodiversity, in simple terms, is a measure of the health of ecosystems. More technically, biodiversity can be defined as a degree of variations of life forms within a species, ecosystem, biome and the entire Earth.
- Climate change is a major problem caused by the increase of human activities leading to several direct and indirect impacts on health. The weather has a direct impact on our health. If the overall climate becomes warmer, there will be an increase in health problems.
- Soil degradation is the decline in soil quality caused by its improper use, usually for agricultural, postural, industrial or urban purposes. Soil degradation is a serious global environmental problem and may be exacerbated by climate change. It encompasses physical, chemical and biological deterioration.
- The impact of climate change on agriculture could result in problems with food security and may threaten the livelihood activities upon which much of the population depends.

Climate change can affect crop yields (both positively and negatively), as well as the types of crops that can be grown in certain areas, by impacting agricultural inputs such as water for irrigation, amounts of solar radiation that affect plant growth, as well as the prevalence of pests.

CONCLUSION

In summary, there are number of potential impacts of climate change on the national development. Climate change is expected to alter the path and rate of economic growth due to changes in natural systems and resources, infrastructure, and labour productivity. Indirectly, loss of livelihood assets may reduce opportunities for full-time education and accessibility to health in numerous ways. Climate change may increase the geographical distribution and prevalence of vector and water borne diseases. Climate change will likely result in declining quality and quantity of drinking water, which is a prerequisite for good health, and exacerbate malnutrition by reducing natural resource productivity and threatening food security in India. However, a series of unprecedented freak events, which we have witnessed in the past, is certainly due to climate change and global warming as UN's Nation Inter-Governmental Panel Working Group paints a dark picture on agriculture, forecasts reduction in the yield of monsoon sorghum grain by 2020 and wheat yield reduction in Indo-Gangetic plains significantly by 2050. Similarly Indian agricultural research Institute also warns that a 10C temperature increase may reduce yield of wheat, soyabean, mustard, potato and groundnut by 2020.

Although the impacts of climate change on health have been documented in India, there have not yet been thorough quantitative studies addressing the many processes at work. This is most likely to be because of the complexity of the many interactions or mechanisms that bear on all aspects of the climate change issues. A key initiative across all issues is community education for adaptation of climate change. The farmers and the general community need to be prepared with news about climate change and possible adaptations in order to ensure food security and unusual health events in coming years. So, there is a need to raise community awareness of links between climate change and health. It is therefore important that the government develops a national framework for an integrated assessment of the impacts of climate change on human health. Such a framework will allow identification of potentially important indirect interactions or mechanisms, identification of important research gaps, and a means of integrating targeted research from a variety of disciplines into an

enhanced understanding of the whole system. Strategies to enhance population adaptation should promote measures that are not only appropriate for current conditions but also build the capacity to identify and respond to unexpected future developments. The restoration and improvement of general public health infrastructure will reduce vulnerability to the health impacts of climate change. In the longer-term and more fundamentally, improvements in the social and material conditions of life and the reduction of inequalities within and between populations are required for sustained reduction in vulnerability to global climate change.

By releasing the NAPCC, the government has shown India's commitment to address climate change issues and also sent a positive message to the public, industries, and civil society about the government's concern to address the climate change issue through concerted action. Similarly, Issues related to the awareness regarding global warming and climate change among the general population and the issue related to agriculture and health hazards due to climate change are planned and addressed strongly and effectively in the country. However, these initiatives must be continuous and sustainable and every individual of the country should contribute to prevent climate change.

REFERENCES

1. "Amar Ujala" Newspaper of 3rd Oct., 2015, "Danger: Climate change can change the size of Earth".
2. Asst Prof. Mishel Coppus, University of British Columbia (Study Published in "Nature Journal").
3. Climate Change in India; its effects: Submerging coastal area (West).
4. Climate Change Science Program 2008. Analysis of the effects of global change on human health and welfare and human systems.
5. Intergovernmental Panel on Climate Change (IPCC) 2007. A Climate Change 2007.
6. PARTHA SEN and SHREEKANT GUPTA, Delhi School of Economics, University of Delhi, NATIONAL AND REGIONAL IMPACTS OF CLIMATE CHANGE ON THE INDIAN ECONOMY.
7. Smith, J.B., Vulnerability to climate change and reasons for concern: A synthesis; Climate change 2001 Impacts, adaptation and vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press; 2001. pp. 913-967.
8. SNIFFER 2009 Differential impacts of climate change in the UK, Scotland and Northern Ireland Forum for Environmental Research.
9. Stern N 2006. The Stern Review: Economic of Climate Change. Cambridge University Press. ISBN – 13: 9780521700801. 700pp.



Dr. Dhruv Kumar Dwivedi
Prof. & Head of Department of Geography ,
Rambai College Dabhaura Rewa (M.P.)

Publish Research Article

International Level Multidisciplinary Research Journal For All Subjects

Dear Sir/Mam,

We invite unpublished Research Paper, Summary of Research Project, Theses, Books and Book Review for publication, you will be pleased to know that our journals are

Associated and Indexed, India

- * International Scientific Journal Consortium
- * OPEN J-GATE

Associated and Indexed, USA

- Google Scholar
- EBSCO
- DOAJ
- Index Copernicus
- Publication Index
- Academic Journal Database
- Contemporary Research Index
- Academic Paper Database
- Digital Journals Database
- Current Index to Scholarly Journals
- Elite Scientific Journal Archive
- Directory Of Academic Resources
- Scholar Journal Index
- Recent Science Index
- Scientific Resources Database
- Directory Of Research Journal Indexing

Indian Streams Research Journal
258/34 Raviwar Peth Solapur-413005, Maharashtra
Contact-9595359435
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com
Website : www.isrj.org