



ACADEMICIA
An International
Multidisciplinary
Research Journal
 (Double Blind Refereed & Peer Reviewed Journal)



DOI: 10.5958/2249-7137.2021.02216.3

CLIMATIC CHANGE AROUND THE WORLD: A REVIEW

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ABSTRACT

Climate change is one of the main problems of our day and puts significant stress to our society and to the environment. From changing weather patterns that endanger food production, to rising sea levels that raise the risk of catastrophic floods, the effects of climate change are global in scope and unparalleled in scale. Without significant action now, adjusting to these effects in the future will be more difficult and expensive. This review deals with the idea of Global Climate Change, the related terminology, causes, consequences, remedies and its possible health impact. It highlights the need to act quickly if we are to prevent an irreversible build-up of greenhouse gases (GHGs) and global warming at a potentially enormous cost to the economy and society globally. Therefore, tackling climate change needs a “unprecedented degree of collaboration, not only between nations, but also across various levels of Governments, private sector and people.

KEYWORDS: *Climatic Change, Global, Greenhouse gases, Weather.*

1. INTRODUCTION

The evidence of climate change is compelling: sea levels are rising, glaciers are retreating, precipitation patterns are changing, and the world is getting warmer. According to the Intergovernmental Panel on Climate Change (IPCC), the current rate of greenhouse gas emissions is likely to cause average temperatures to rise by 0.2°C per decade, reaching by 2050 the threshold of 2°C above pre-industrial levels. Recent evidence suggests even more rapid change, which will greatly, and in some cases irreversibly, affect not just people, but also species and ecosystems[1].

Climate change indeed is real. Super typhoon Haiyan is the latest natural disaster that has also led credence to the reality of climate change. This sad occurrence hit land and devastated the

Philippines. This record-breaking storm is the strongest storm in history to make landfall. It tore apart buildings and left entire provinces without power or communication. The 370-mile-wide storm packed winds 3.5 times as strong as Hurricane Katrina. Winds reached 195 mph and had gusts of up to 235 mph. Walls of water as high as fifteen feet swept over the country washing away towns on many islands and washed ships ashore where homes once stood. The U.N. says, "Around 920,000 people were displaced by the storm and a total of 11.8 million people have been affected. Officials said the deadly storm left more than 3850 injured and at least 77 people reported missing across the Philippines." Climate change is a serious risk to poverty reduction and could undo decades of development efforts. While climate change is global, its negative impacts are more severely felt by poor people and poor countries. They are more susceptible because of their heavy reliance on natural resources and low capability to deal with climate unpredictability and extremes. Restoring and sustaining important ecosystems may assist communities in their adaptation efforts and support livelihoods that rely upon the services of these ecosystems. Moving towards low-carbon society may help decrease greenhouse gas emissions, increasing human health and well-being and generating green jobs[2].

Climate change is a reality of life. We need to act quickly if we are to prevent an irreversible build-up of greenhouse gases (GHGs) and global warming at a potentially enormous cost to the economy and society globally. Organisation for Economic Co-operation and Development (OECD) research indicates that if we act now, we have 10 to 15 years' "breathing space" during which change is feasible at a very moderate cost. But every year of delay decreases this breathing room, while needing ever more severe efforts to make a difference. Current financial crisis is not a cause to wait. Indeed, its macroeconomic implications will be addressed in a relatively short period, after which growth will resume, whereas the costs of inactivity on global warming will continue to become more and more expensive over time[3].

This research provides an overview of Global Climate Change with a goal to assist understand the idea, its urgency and to give an insight to the ways it impacts society and the natural environment and proffering remedies.

2. LITERATURE REVIEW

Singer & Avery in his study discloses about the Climate change and global warming, terms that are sometimes used synonymously, but they have different meanings in the sense that a 'warming' is only one phase of the larger climate system on Earth that naturally features change. Physical evidence on Earth and in space has helped scientists understand that there are many factors that can contribute to the changing of the planet's climate on a long-term basis. Examples of these factors are solar radiation levels, Earth's orbit around the sun, volcanic activity, ocean currents, and even plate tectonics. The periods of warming and cooling are referred to as interglacials and glacials, respectively, with the latter being partly characterized by enormous sheets of ice extending from the poles. Recent periods of change within human history include the Medieval Warm Period (A.D.1000-1270) and the Little Ice Age (A. D. 1270-1850)[4].

Weart in his another study discusses about the history of climate change discussion among people goes farther back in time than one might think. Weart (2007) notes that climate change was conceptualized in ancient times, with knowledge of the subject growing as the technology to study it improved over time. An important figure in climate science history who warned of possible problems was Guy Stewart Callendar, whose idea of carbon dioxide as a heat \strapping

agent was indeed borne out by computer climate simulations in the 1970s- “Even subtle changes in the Earth's orbit could make a difference. To the surprise of many, studies of ancient climates showed that astronomical cycles had partly set the Research on Climate Change 13 timing of the ice ages. Apparently the climate was so delicately balanced that almost any small perturbation might set off a great shift”[5].

Leiserowitz, (2007) In a research published by him, the argument is made that people's understanding of climate change is important to resolving the problem since it is in the public arena that political pressure develops. “Public opinion is important because it is a major component of the socio-political environment in which policy maker function. Public opinion may fundamentally force or restrict political, economic, and social action to address specific dangers. Although there is not a significant quantity of evidence from which to make conclusions regarding American citizens' view of climate change risk, numerous polls in recent years may enlighten inquiries about current thinking in the nation[6].

3. DISCUSSION

3.1 Natural Consequences:

These are already apparent, for instance, temperatures are increasing, polar caps are melting, sea level is rising, the deserts grows and the winters in Europe get progressively wetter. It has been scientifically proven that Mount Kilimanjaro over the years contains less and less snow as a result of global heating. It is unclear if this peak in Tanzania will be covered with snow at all in 50 years. It is also determined that the number of natural catastrophes grows more and more. Tsunamis, floods and severe drought are more often than in times past. In the years 1950-1960 globally 13 natural catastrophes have been recorded, against 72 in the decade 1990-1998. Now the effects are plainly apparent and most likely they will only grow in size and frequency in the future. The IPCC forecasts that climate change will become evident in the following major ways:

- By approximately 2100 global temperatures will have increased by between 1.1°C and 6.4°C. The precise rise relies on future emissions of greenhouse gases and other pollutants and on the combined action of physical and chemical processes in the atmosphere.
- Some areas of the globe will get more precipitation, with others being drier.
- In the course of the current century sea levels will increase by between 18 and 59 cm. This is because warmer water takes more space than cold water and because of the retreat of glaciers and polar ice sheets. Our knowledge of the melting of the Greenland and Antarctic ice sheets is still inadequate. This, together with the fact that there may be significant regional differences in sea level rise, implies that in certain areas of the globe the effects may be much more severe than projected by IPCC.
- The Gulf Stream, which carries comparatively warm water from the Caribbean to Europe, is projected to decrease in intensity, leading temperatures in northwest Europe to increase less dramatically than elsewhere. Standard climate models, however, make no account for a sudden shift in the Gulf Stream[7].

3.2 Economic Consequences:

Changes in global climate will have significant implications for living nature as well as the economy. Even a modest increase in mean annual temperature may have a significant effect on a region's ecology and biological diversity. Biodiversity is of vital significance for the stability of ecosystems as well as for human health. The economic impact of drought, floods and other climate change effects will become quite substantial. Some researchers estimate that these costs are set to rise to between 5 percent and 20 percent of global income. The IPCC has not yet managed to provide a rock-solid cost estimate of the consequences of climate change. It has estimated the cost of limiting further change, though. If such action is taken, global income will grow by only slightly less than if nothing is done: overall economic growth up to the year 2030 would then be 3 percentage points lower (57 percent instead of 60 percent, for example) (57 percent instead of 60 percent, for example).

Avoiding extreme climate change is also important if the "Millennium Development Goals" are to be achieved, formulated by the United Nations as follows:

- Eradicate extreme poverty and hunger.
- Achieve universal primary education.
- Promote gender equality and empower women.
- Reduce child mortality.
- Improve maternal health.
- Combat HIV/AIDS, malaria and other diseases.
- Ensure environmental sustainability.
- Develop a global partnership for development.

That climate policy and the Millennium Goals go hand in hand is readily illustrated. In regions where climate change leads to more severe drought, for example, poverty and hunger will be exacerbated rather than eradicated. Climate change will mean that malaria spreads further round the globe rather than being effectively combated. The multiple impacts of climate change on biodiversity will mean less environmental sustainability, not more. The message is clear: if climate change is not halted, the Millennium Goals will simply not be achieved[8].

3.3 Potential Health Impacts of Climate Change:

The most immediate effects on health include those related to changes in exposure to weather extremes (heatwaves, winter cold); increases in other severe weather occurrences (floods, cyclones, storm-surges, droughts); and increased production of some air pollutants and aeroallergens (spores and moulds) (spores and moulds). Decreases in winter mortality owing to milder winters may compensate for increases in summer mortality due to the increasing frequency of heatwaves. In nations with a high incidence of excess winter mortality, such as the United Kingdom, the positive effect may outweigh the negative. The degree of change in the frequency, severity and location of severe weather events owing to climate change remains unclear. Climate change, operating through less direct processes, will influence the spread of numerous infectious illnesses (particularly water, food and vector-borne diseases) and regional

food production (especially cereal grains) (especially cereal grains). In the longer run and with significant heterogeneity across populations as a result of location and susceptibility, these indirect effects are likely to have larger magnitude than the more direct. For vector-borne infections, the distribution and abundance of vector organisms and intermediate hosts are affected by various physical (temperature, precipitation, humidity, surface water and wind) and biotic factors (vegetation, host species, predators, competitors, parasites and human interventions) (vegetation, host species, predators, competitors, parasites and human interventions).

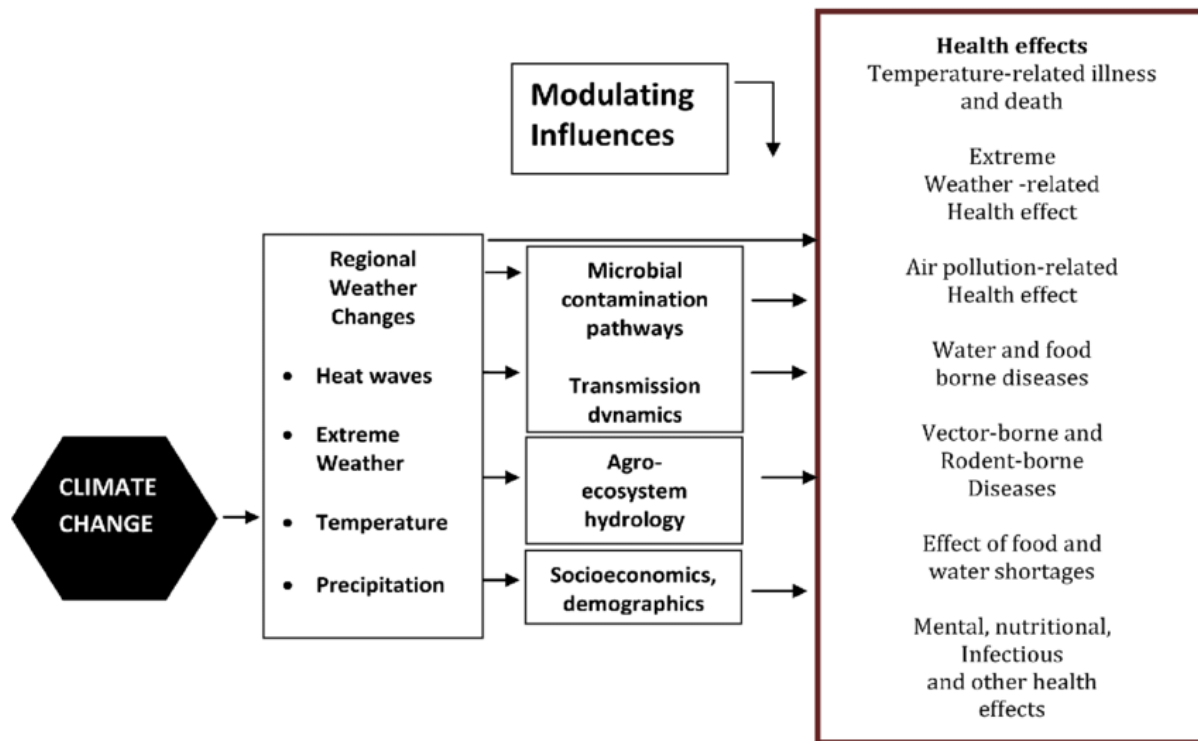


Figure 1: Pathways by which climate change affects human health including local modulating influences and the feedback influence of adaptation measures.

By reflecting the greater retention of heat energy in the lower atmosphere, global warming also impacts the atmospheric heat budget so as to enhance the cooling of the stratosphere. Should this cooling persist, the process of ozone depletion may continue even after chlorine and bromine loading (by human emission of ozone-destroying chemicals) begins to decrease. If so, the possible health implications of stratospheric ozone depletion (increase in frequency of skin cancer in fair-skinned people; eye diseases such as cataracts; and, possibly, inhibition of immunological function) would become a problem for climate change[9]. The main pathways and categories of health impact of climate change are shown in Figure 1.

3.4 Adaptation Solutions:

Adaptation is procedures by which civilizations make themselves better equipped to deal with an unpredictable future. Adapting to climate change involves adopting the proper steps to minimize the negative impacts of climate change (or exploit the favourable ones) by making the required

modifications and changes. The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as ‘adjustment of natural or human systems in response to current or anticipated climatic stimuli or their consequences, which moderates damage or exploits favourable possibilities. The effects of climate change may be observed all around the globe. Sea level rise, flooding, hotter summers and wetted winters are the image of present and future. The important issue is to what extent these changes will endure and how we should adjust to them. Contrary to mitigating methods, adaptive solutions do not contribute to a decrease of the climatological issues. Instead, we resign ourselves to the changes and adjust ourselves as best we can to the consequences. This implies that considerable infrastructure development will be needed: raising of dikes, upgrading of sewage systems, creating more room for water and similar measures. We must become aware of the reality that we will not always be secure any longer (from floods), but we must adjust ourselves to the changes:

- Sea level rising/floods/water nuisance.

When contemplating the rise of the sea level and the increasing potential of flooding in a nation, the Netherlands for example, there are two paths to a solution. On the one hand the Dutch can defend their nation even better by increasing the dikes and strengthening the coastal regions. But by doing this, the repercussions in case of a failure (the breaking of a dike) would only be greater. In reality, increasing dikes will only be like erecting a high protective wall around the nation, producing a sort of ‘bath tub’ at the same time. If the protection wall fails the consequences will be greater. Another adaptive approach is learning to live with floods. Instead of focusing on reinforcing the protective regions (dunes and dikes) we rather concentrate our efforts in minimizing the effects. This too will decrease the danger. After all, risk is defined as opportunity x consequence. If the opportunity stays the same, but the repercussions are less severe, the risk will drop. And precisely the limitation of the consequences can be started out on local government level. You might conceive of local regulations like “no constructions in lower parts of the country” or on the contrary “especially suited constructions in lower areas of the country”[10].

- Drought and desertification.

The UN-plan that was approved in 1994 emphasizes a “bottom-up”-approach, with which one aims to identify especially local solutions to avoid desertification along with the local people. One attempts to discover the answer in sustainable development, addressing social, economic and ecologic issues at one time. A comparable attitude requires quite a co-ordination and tight cooperation across regional, national and international authorities, but environmentalists are not persuaded that the political will to take steps is strong enough to reverse the trend. To resist the increasing desertification, in 1994 the Convention to Combat Desertification (CCD) was established, as a result of the Earth summit of 1992. The Convention, which in the meanwhile has been signed by 191 countries, came into effect in December 1996. To restore damaged ecosystems productive again is a long lasting process and needs an integrated strategy of rural development, extension of irrigation infrastructure and use of new technology. Still, it is conceivable. In China the amount of fertile soil disappearing annually decreased between 2000 and 2004. In February the Chinese government announced a plan to recover 250.000 square kilometres from the desert by 2020 by means of planting trees and grass. Also, the Chinese government intends to invest in arid areas in the effective use of water and renewable energy

sources, such as wind and water. Furthermore it is the view of the UN-Environmental organization (UNEP) that when it is impossible to reverse the tide, one should make a virtue of necessity. The narrative of a report that was published 5 June read as: “As long as deserts become more hostile and less suited for human settlement, we must be creative and take advantage of the current situation”. UNEP sees a significant potential especially for the use of solar energy, fish-production, study of the therapeutic qualities of desert plants and the development of crops resistant to drought and salt. Also, new technology to create more effective irrigation systems and to desalinate estuaries may assist[3].

Heat

Temperature increase induced by climate change may in severe circumstances (hot) have a direct detrimental effect on the human health. Possible health consequences in Europe are: difficulties by heat stress, rise of the propagation of Lyme’s disease, effects of poor air quality (summer smog) and an increase of allergies. Population groups at high risk (such as the elderly, children or asthmatic individuals) may suffer higher impacts (a greater illness load) (a greater sickness burden). Policy can play a significant role in the limitation of the health consequences of climate change. The Netherlands ought to be competent to resist some health consequences of climate change, by means of the maintaining/improving of existing policies or with new policy choices. Little is known regarding biological or passive adaptation of man to climate change (for example acclimatization, vaccination) (for example acclimatization, immunization). Possible policy options/adaptation possibilities are amongst others:

- Improving of living circumstances, e.g. air conditioning, ventilation.
- Improving of preventive/curative health care, e.g. people with specific educations, immunization.
- Monitoring/alarm systems.
- Public information/education.

Some adaption options will be more successful and/or cost-efficient than others[4].

4. CONCLUSION

Climate change is occurring and it is driven mainly by human activities. Its effects are starting to be seen and will be exacerbated in the decades ahead unless we take action. The rising pace of global warming—courtesy of carbon dioxide and other greenhouse gas emissions from human activities—have led to climatic changes and environmental degradation, which in turn have resulted to significant difficulties in connection to illnesses and human health. Many illnesses which were previously unknown in particular climatic zones are now making their way to such regions, owing to changes in the weather circumstances. Further, several illnesses that had been believed extinct are re-emerging in regions with changed climatic circumstances that promote their return. It is therefore important that stakeholders and decision makers at industrial, government and international policy levels come up with stringent and workable means of cutting down on greenhouse gases emission to combat the spread of global warming effects, and the resultant climate change, which has produced devastating impacts especially among poorer nations. Further, there should be increased funding of adaptation and coping programs and

projects in affected areas to minimize the impacts on human health and curtail the spread of diseases.

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