

IMPACT OF CLIMATE CHANGE – NURSES ACCOUNTABILITY



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INTRODUCTION:

Weather is considered to be the atmospheric conditions that are happening now or within a few weeks. On the other hand climate represents the long term atmospheric patterns within which weather occurs. As the popular saying goes “**Climate is what you expect, and Weather is what you get**”¹. Intergovernmental Panel on Climate Change (IPCC) forecasts an increase in world average temperature by 2100 within the range 1.4-5.8 degrees Celsius². In recent report, the Intergovernmental Panel On Climate change (2012) concludes that there is strong evidence that the world climate is changing in response to human activities and in turn causing direct and indirect impacts on human and natural systems such as human health, food security because the magnitude of abrupt changes in the climate anticipated in the future.² (IPCC, 2014). Extreme heat already threatens the health of local communities, who suffer dehydration, heat Cramps, heat exhaustion, heat syncope or heat stroke, and even heat-related death. Climate change will only intensify extreme heat events¹. Nurses are uniquely qualified to bring information on climate change to the public. They have both the necessary scientific background and the communication skills to get the message across in an understandable way. Their expertise in health promotion and behavior change also equips them to foster life style choices that will decrease green house

gases (GHG) emissions by individual, families and communities³.

SCIENCE OF CLIMATE CHANGE:

Climate change as a “change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods” (The United Nation Frame Work Convention for Climate Change (UNFCCC-1992).

Climate change is the result of both natural variability and human-induced contributions, the warming seen today cannot be explained by natural processes alone. Greenhouse gases (GHGs) are necessary for life to exist on Earth because they trap heat in the atmosphere, which warms our planet and in a state of equilibrium. Earth’s most abundant GHGs are water vapor, Carbon Dioxide, atmospheric Methane, Nitrous Oxide (NO), Ozone (O₃) and Chloro-Fluro-Carbons (CFCs). **Greenhouse effect** is a process by which radioactive energy leaving a planetary surface is absorbed by some atmospheric gases called greenhouse gases⁴.

FACTORS INFLUENCING CLIMATE CHANGE:

The important factors, which are responsible for climate change and are causally contributed by human civilization on earth, are listed below:

- ❖ Greenhouse Gases
- ❖ Deforestation
- ❖ Land-use Change
- ❖ Energy Usage
- ❖ Vehicular Usage

GREENHOUSE GASES

Human civilization and industrialization have amplified the emissions of “Greenhouse Gases”, which are considered to be one of the main causal factors accelerating climate change in the post industrialization era. GHGs constitute:

- ❖ Carbon Dioxide (CO₂),
- ❖ Methane (CH₄),

- ❖ Nitrous Oxide (N₂O),
- ❖ Hydrofluorocarbons (HFCs)
- ❖ Perfluorocarbons (PFCs)
- ❖ Sulphur hexafluoride (SF₆)

CO₂ is the most important anthropogenic GHG as it constitutes about 70% of the total emissions. The global increases in CO₂ concentrations are primarily due to:

- ❖ Fossil Fuel Use
- ❖ Land-use and Land-use Change
- ❖ Agricultural activities
- ❖ Industrial Development
- ❖ Forestry

Methane is generated due to the following activities:

- Agriculture.
- Energy Sources like biomass burning, coal mining and handling and flaring of natural gas systems.
- Waste disposal.
- Land-use.
- Land-use Change.
- Forestry.
- Shifting Cultivation practice.

In India, the Methane emissions in the year 1994 were 18,583 Gg, (Giga gram) out of which 78% came from agriculture, 16% from energy sources and 6% from waste disposal. The rest is contributed by other activities mentioned above.

DEFORESTATION

There is considerable reduction in the forest cover due to encroachment and land use change and economic development activities like construction of roads, canals and power stations. Forests are the major source of carbon sequestration and the womb of the biodiversity, which acts as the main artery of any environment and ecosystem.

LAND-USE CHANGE

Land-use change is another major predicament to be viewed seriously. As per the data available, after the enactment of Forest Conservation Act, 1980, a huge portion of forestland is diverted for non-forest use.

ENERGY USAGE

After the liberalization and globalization, India is on

a high growth path and envisages about 7-8% GDP growth rate per annum. The energy generation has grown manifold due to the ever increasing demand for energy since 1992. Coal, Gas and Diesel being the major sources of power in India, the emissions of GHGs are also on the rise.

VEHICULAR USAGE

The number of vehicles registered in India is on the increase over the last 7 years at an average annual cumulative rate of 10% (data from 2004 to 2011). It indicates the increases in the use of fossil fuel and thereby an increases in GHG emissions. Data reveals that there has been consistent growth in vehicular registration; however no indication on the emission load is available. Continued emission of greenhouse gases will cause further warming and long lasting changes in all components of the climate system, increasing the likelihood of severe, Pervasive and irreversible impacts for people and ecosystems⁴.

CLIMATE CHANGE AND IMPACT ON HUMAN HEALTH:

The adverse effects associated with climate change will likely fall disproportionately on their population. There is a high incidence of occurrence of vector borne diseases like Malaria, Kala-azar, Japanese Encephalitis, filaria, Chikungunia 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 enlarge the transmission windows. Effluent emissions to water bodies and salination of rivers through sea level rise may increase the incidence of water borne diseases⁹. Deaths due to heat wave are reported from several parts of the country from time to time, particularly during the summer⁵.

An increase in frequency of extreme events such as storms, floods, drought and cyclones would harm human health in many different ways. An increase in frequency of extreme weather events could cause direct loss of life and injury. It could also affect the health of human beings indirectly through a variety of ways including:

Loss of shelter.

Population displacement.
 Contamination of water supplies.
 Loss of food production (leading to hunger and malnutrition),
 Increased risk of infectious disease epidemics.
 Damage to infrastructure for provision of health services. (McMichael, 2003)

Some health consequences due to extreme weather events arise during or soon after the event. In the case of a flood, injuries, communicable diseases, or exposure to toxic pollutants occur soon after the event. Consequences of a flood that result later on are malnutrition and mental health disorders. Another extreme weather event that will have significant consequences to human health is excessive rainfall. This is because excessive rainfall facilitates the entry of human sewage and animal wastes into waterways and drinking water supplies, potentiating waterborne diseases¹². (McMichael, 2006).

Diarrheal diseases are conditions also caused by parasitic diseases such as amoebiasis, giardiasis and cryptosporidium. An increase in floods a result of climate change can cause contamination of public water with both bacteria and parasites as surface water discharge flows into rivers and reservoirs, while drought can increase the concentration of pathogens in the limited water supplies⁵. (McMichael, 2003).

“Currently the World Health Organization (WHO) estimates more than one billion people worldwide to be without access to safe drinking water, and that every year approximately 1.7 million die prematurely because they do not have access to safe drinking water and sanitation”. These effects of a reduction in the availability of clean water includes an increase in the risk of drinking contaminated supplies and also a reduction in the amount of water available for personal hygiene, thus leading to skin infections .(McMichael, p.60, 2003)

ADAPTATION AND MITIGATION TO CLIMATE CHANGE: Adaptation to climate change has been defined as “an adjustment in human systems in response to actual or expected climatic stimuli or their effects, which reduces the associated risks to

population health through preventive measures”. In order to assess the health impacts of, and vulnerability to, climate change, it is essential to consider adaptation.

At the international level, development funding can increase the capacity of populations to adapt to climate change by strengthening public health systems, improving economic development and increasing access to education³ (CNA, 2008). “Adaptation can be undertaken at the international/national, community and individual level—that is, at macro, meso and micro-levels” Adaptive actions to reduce health impacts from climate change are considered in terms of the conventional public health categories primary, secondary, and tertiary prevention.

Primary prevention is an intervention implemented before there is evidence of disease or injury, such as avoiding hazardous exposure or removing causative risk factors.

Example: Bed nets can be supplied to populations at risk of exposure to malaria. Early warning systems (such as extreme heat warnings and famine early warning) to provide information on hazards and recommended actions to avoid or reduce risks.

Secondary prevention is an intervention implemented after a disease has begun, but before it is symptomatic (such as early detection or screening measurements).

Examples: enhancing monitoring and surveillance, improving disaster response and recovery, and strengthening the public health system’s ability to respond quickly to disease outbreaks.

Tertiary Prevention is an intervention that attempts to minimize the adverse effects of an already present disease or injury

Example: better treatment of heat stroke and improved diagnosis of vector-borne diseases.

“Mitigation of climate change refers to reducing green house gas emissions to reduce the hazard” (CNA, p.8, 2008). This means reducing the consumption of fossil fuels we use and promoting forestry and agricultural measures that increase the uptake of carbon dioxide by carbon sinks. The ultimate goal of

mitigation is stabilization, which “requires that annual emissions be brought down to the level that balances the Earth’s natural capacity to remove the greenhouse gases from the atmosphere” Identified strategies have been identified that could be undertaken by various sectors of the economy (including energy supply, transport, buildings, industry, agriculture, forestry and waste) to reduce green house emissions. Some of these strategies include the use of new technologies, such as fuel-efficient cars and lighting, while others are intended to increase the effectiveness of carbon sinks.

ROLE OF NURSE IN ADOPTION AND MITIGATION TO CLIMATE CHANGE

Nurses can play a major role in emergency planning/preparedness for climate changes, including involvement of nurses at all levels of Government planning. There are many roles nurses can play in the mitigation to climate change. “Nurses can act on climate change by:

- Providing a handout on the subject as part of discharge planning.
- Mentioning climate change and what can be done during prenatal classes.
- Raising the issue at team or staff meetings.
- Joining the workplace health and safety committee to support operating choices that lower GHG emissions.
- Sitting on urban planning committees to reduce the trend to development of suburbs and exurbs and becoming involved in climate change discussion in their communities”
- Stress to the patients and the public that many consumer choices intended to produce fewer green house gases are also good for health.

Example: Walking or biking to work rather than driving promotes cardiovascular fitness, driving at the posted speed limit is safer than speeding, and insulating homes properly means mould is less likely to grow” (CNA, p.9, 2008).

CONCLUSION:

Climate change threatens the basic elements of life for people around the world-access to water, food,

health and the use of land and the environment. Our changing climate has led to increase in the malnutrition and diarrhea that already exists in low income countries. Nurses as health care professional with along history of focusing on the needs of the individual, families and communities represents a trusted source of information which will assist them to support adaptation to climate change.

REFERENCES:

1. Advisory Group on Energy and Climate (AGECC), New York, NY, USA, 24pp.
2. IPCC, 2014a: Annex II: Glossary [Agard, J., E. L. F. Schipper, J. Birkmann, M.Campos. Mastrandrea and T. E. Bilir (eds.)].
3. Canadian Nurses Association (2008). “The Role of Nurses in Addressing Climate Change.” Canadian Nurses Association, 1-17. Retrieved from <http://www.cna.com/roleofnursesinclimatechange> on March 15th, 2011.
4. K.R. Kumar, et al., “High-resolution climate change scenarios for India in the 21st century,” Current Science 90(3), February 2006: <http://www.ias.ac.in/currsci/feb102006/334.pdf>
5. McMichael, A.J. (2006). “Climate Change and Human Health.” World Health Organization, 1- 306. Retrieved from www.who/climatechange.com on March 15th, 2011.
6. EPA(2011). Climate Change. Retrieved from <http://www.epa.gov/climatechange/> on February 15th, 2011.Climate Education for K-12, [http:// Google Weblight.Com](http://www.google.com/webglight).
7. “Indian Network for Climate Change Assessment”. Climate Change And India:A4x4 Assessment-A Sectoral And Regional Analysis For 2030s”
8. Pfeiffer, Allyson J., “The Effects of Climate Change on Public Health and the Healthcare Provider’s Role in Addressing Climate Change” (2011). Senior Honors Projects. Paper 216.