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## **Climate Change and Human Health: The Place of Home Economics Education.**

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### **Abstract**

**T**he paper examined the role of combustion and aerosols in the atmosphere and their effects on our planets surface. The paper also discussed effects of increased temperature, extreme weather events, it further discussed climate sensitive diseases, fire, air quality and other health linkages, those at risk and the place of Home Economics Education were highlighted. Conclusion and recommendation were made.

## Introduction

Climate change refers to a change in the state of the climate that can be identified by changes in the mean and/or variability of its properties and that persists for extended periods, typically decades or longer (international panel on climate change (IPCC) 2007 d 30).

Over the last fifty (50) years, human activities-particularly, the burning of fossil fuels (coal, oil and natural gas-have release sufficient quantities of carbon dioxide and other green house gasses to trap additional heat in the lower atmosphere and affect the global climate. In the last 100 years, the world has warmed by approximately  $0.75^{\circ}\text{C}$ . Over the last 25 years, the rate of global warming has accelerated, at over  $0.18^{\circ}$  per decade (Hadley Research centre, 2008). In line with the above, Horton and Costello, (2011), stated that in the combustion of biomass for example wood, crop residues, dried dung and fossil fuel, the primary end product is the gas carbon dioxide. The gas is colorless and invisible to the eyes. Also formed during the combustion process under certain conditions and to a lesser extents, are small black particles which one can see (such as from diesel

Engines or lit candles with long wicks and which have recently been recognized by scientists as a contributor to global warming (Johnson, 2011).

Black carbon or soot is a part of a larger type of missions, both natural and manmade call aerosols. These aerosols are very small particles that are suspended in the atmosphere. They can originate from natural sources such as

salt spray formed during ocean wave processes, dust formed from the grinding and erosion of land surfaces, forest fires and volcanic eruptions for example. The role that these aerosols play in the atmosphere according to Horton and Costello (2011), include enhancing cloud formation and precipitation; that this can have either a cooling or warning effect depending on variety of other factors. For example, a large volcanic eruption can inject millions of tons of small light coloured particles high into the atmosphere where by reflect sunlight back into space causing a cooling effect. This effect can be measured by a temperature drop on the planet's surface; for example when mt. Pinatubo in the pippines erupted in 1991, global average temperatures actually dropped a degree or two until the particles settled out and warming again resumed (IPCC 2007 4<sup>th</sup> Assessment Report. P 163).

## Increased temperature

Heat exposure has a range of health effects, from mild heat rashes to deadly heat stroke. Heat exposure can also aggravate several chronic diseases, including cardiovascular and respiratory disease. The results can be severe and result in both increased illness and death. Health also increases groundlevel ozone concentrations, causing direct lung injury and increasing the severity of respiratory disease such as asthmas, chronic obstructive pulmonary disease. Higher temperatures and heat waves increased demand for electricity and thus combustion of fossil fuels.

generating air borne particular and directly leading to increased respiratory disease.

Increased temperatures have other effects ranging from drought to ecosystem changes that can affect health. Drought contaminates that negatively affect the chemistry of surface waters in some areas; drought may also strain agricultural productivity and could result in increased food prices and food shortages in Nigeria and elsewhere. Ecosystem changes include migration of the vectors that transmit (not cause disease) infection by carrying pathogens from one host to another such as *Anopheles* mosquitoes that cause malaria disease that are prevalent in Nigeria. The dynamics of disease migration are complex and temperature is just one factor affecting the distribution of those diseases.

Winters (rainy seasons and harmattan) will also be warmer, which is likely to lead to a decrease in illness and death associated with exposure to cold. Although global warming may bring some localized benefits, such as fewer winter deaths in temperate climate and increased food production in certain areas, the overall health effects of a changing climate are likely to be overwhelmingly negative. Climate changes affect the fundamental requirements of health: clean air, safe drinking water, sufficient food and secure shelter (Kalkstein, Valimont and Laurence 2011).

### **Extreme weather events**

The direct effects of extreme

weather events include drawing from floods; injuries from floods and structural collapse, indirect effects outnumber the direct effects and likely will be more costly. Potential indirect effects include aggravation of chronic disease due to interruptions in health care service, significant mental health concerns both from interrupted care and geographic displacement, and socio-economic disruption resulting from population displacement and loss of infrastructure (Horton and Costello 2011 and Robine 2008).

Sea level rise increases the risk from extreme weather events in coastal areas, threatening initial infrastructural and worsening immediate and chronic health effects. Salt water entering/fresh-water drinking supplies are also a concern for these regions and increase salt content in soil can hinder agricultural activities in coastal areas (Wikipedia the free encyclopedia 2011). Research based on satellite observations (2010) shows an increase in the flow of freshwater into the world's oceans partly from melting ice and partly from increased precipitation driven by an increase in global ocean evaporation. The increase in global fresh water flow, based on data from 1994 to 2006, was about 18%. Much of the increase is in areas which already experience high rainfall, one of the effects, as perhaps experienced in the 2010 Pakistan floods is to overwhelm flood control infrastructure (satellite-based global-ocean mass 2010).

Extreme high air temperatures contribute directly to deaths from

cardiovascular and respiratory disease, particularly among elderly people. In the heat wave of summer 2003 in Europe for example more than 70,000 excess death waves recorded (Robine 2008). He also stated that high temperatures also raise the level of ozone and other pollutants in the air that exacerbate cardiovascular and respiratory disease. And that urban air pollution causes about 1.2 million deaths every year (Robine 2008). That pollen and other aeroallergen level are also higher in extreme heat which can trigger asthma that affects round 300 million people. This on going temperature increases are expected to increase this burden.

Globally, the number of reported weather related natural disasters has more than tripled since the 1960s. every year, these disasters result in over 60,000 deaths, mainly in developing countries (Arnell 2004). He also stated that rising sea levels and increasingly extreme weather events will destroy homes, medical facilities and other essential services as more than half of the world's population lives within 60cm of the sea. People may be forced to move, which in turn heightens the risk of a range of health effects, from mental disorders to communicable disease. Arnell (2004) is of the view that lack of safe water can compromise hygiene and increase the risk of diarrhea disease which kills 2.2 million people every year. He observed that in extreme cases, water scarcity leads to drought and famine. He projected that by 2090s, climate change is likely to widen the areas affected by drought, double the frequency of

extreme droughts and increase their average durations six fold (Arnell 2004).

According to IPCC (2007) rising temperatures and variable precipitation are likely to decrease the production of staple foods in many of the poorest regions- by up to 50% by 2020 in some African countries, Nigeria inclusive. This will increase the prevalence of malnutrition and under nutrition which currently cause 3.5 million deaths every year (IPCC 2007).

### **Climate Sensitive Disease**

Climate change may increase the risk of some infectious diseases, particularly those diseases that appear in warm areas and are spread by mosquitoes and other insects. These vectors borne diseases include malaria, denque fever, yellow fever, and encephalitis (Zhon 2008). Also, algal blooms could occur more frequently as temperatures warm-particularly increase with polluted waters in which case disease such as cholera that tend to accompany algal blooms could become more frequently (Hale 2002). Confalonieri, menne, Akhtar, Ebi, Hanengue, Kovats, Revich and Woodward, (2007), projected that climate change would continue to change the range of source infections disease vectors. Vector-borne disease (VBD) is infectious transmitted by the bite of infected arthropod species, such as mosquitoes, ticks, triatomine bugs, sandflies, and blackflies. There is some evidence of climate change related shifts in the distribution of tick vectors of disease, of some (non-malaria) mosquito

victors in Europe and North-America. Climate change has also been implicated in changes in the breeding and migration dates of several birds' species (confalonienetal 2007). Several species of wild bird can act as carries of human Pathogens as well as vectors of infectious agents.

There is good evidence that disease transmitted by rodents some times increase during heavy rainfall and flooding because of altered patterns of human pathogen rodent contact (confalonien et al 2007 C).

Higher temperatures, combination with favourable rainfall pattern, could prolong disease transmission seasons in some locations where certain diseases already exist. In order locations, climate change will decrease transmission through reductions in rainfall or temperatures that are too high for transmission. For example, temperature and humidity levels must be sufficient for certain disease carrying vectors, such as ticks that carry lyme disease, to thrive. And climate change could push temperature and humidity levels either towards or away from optimum conditions for the survival rate of ticks.

Though, global temperatures are expected to continue to rise, the potential for an increase in the spread of diseases will depend not only on climate but also on non climate factors, primarily the effectiveness of the public health system (WHO 2003).

The IPCC (2007), has noted that the global population at risk from vector borne malaria will increase by between 220 million and 400 million in the next

century. While most of the increase is predicted to occur in Africa, source increased risk is projected in Britain, Australia, India and Portugal (IPCC 2007).

Tick borne lyme disease also may also expand its range in Canada, however, socio-economic factors such as public health measures will play a large role in determining the existence or extent of such infections. Water-borne disease may increase where warmer air and water temperatures combine with heavy run off from agricultural and urban surfaces but may be largely continued by standard water heat practices.

### **Diarrhoeal Diseases**

Confalonien et al (2007 a) concluded that climate change which increase the burden of diarrhoeal, childhood mortality due to diarrhea in low income countries, especially in sub-Saharan African remains high. This is despite improvements in care. Several studies have shown that transmission of enteric pathogens is higher during the rainy season. Some studies have found that higher temperature was strongly associated with increased episodes of diarrhoeal disease in adults and children in Peru, The WHO projected that climate change would increase the burden of diarrhoeal diseases in low income regions by approximately 2 to 5% in 2020 (confalonien et al 2007).

### **Fires**

In some regions changes in temperature and precipitation are

projected to increase the frequency and severity of fire events (confalonierietal 2007 e). Forest and bush fires cause burns, damage from smoke inhalation and other injuries.

### **Air Quality**

Climate change is expected to contribute to some air quality problems (IPCC 2007). Respiratory disorders may be exacerbated by warming-induced increases in the frequency of smog (ground-level Ozone) events and particulate air population.

Ground-level Ozone can damage lung tissues, and is especially harmful for those with asthma and other chronic lung diseases. Sunlight and high temperatures, combined with other pollutants such as nitrogen oxides and violatic organic compounds, can cause ground- level Ozone to increase, climate change may increase the concentration of ground level Ozone, but the magnitude of the effects is uncertain. For other pollutants, the effects of climate change and/or weather are less studied and results very by region (IPCC 2007).

Another pollutant of concern is "particulate matter" (PM), also known as particle pollution. Particulate matter is a complex matter of extremely small particles and liquid droplets. When breathed in, these particles can reach the deepest regions of the lungs. Exposure to particles pollution is linked to a variety of significant health problems. Particle pollution also is the main cause of visibility impairment (maze) in the nation's cities and national packs. Climate change may indirectly affect the

concentration of PM pollution in the air by affecting natural biogenic sources of PM such as wildfires and dust from dry soils.

### **Other Health Linkages**

Other, less direct linkages exist between climate change and human health, for example, regional climate change impacts on agricultural yields and production are likely to grow over times, with the most negative effects expected in developing countries. This is expected to increase the number of undernourished people globally and consequently leads to complications in child development (IPCC, 2007).

Climate change may also contribute to social disruption, economic decline, and displacement of populations in certain regions (PDF) (22 PP 912k, about PDF), due to effects on agricultural production, already scarce water resources, and extreme weather events e.g. Schwdrtz and Randall, 2003). These issues are likely to be more several in developing countries and may worsen human health and well-being in affected regions (IPCC 2007).

### **Measuring the Health Effects**

Measuring the health effects from climate change can only be very approximately. But a WHO. Assessment, taking into account only a subset of the possible health impacts concluded that the modest warming that has occurred since the 1970s was already causing over 140,000 excess death annually by the year 2004 (WHO 2009).

### **Those that are at Risk**

All populations will be affected by climate change, but some are more vulnerable than others. People living in small island and developing states and other coastal regions, mega cities, and mountainous and polar regions are particularly vulnerable.

Children- in particular children living in poor countries are among the most vulnerable to the resulting health risks and will be exposed longer to the health consequences. The health effects are also expected to be more severe for elderly people and people with infirmities or pre-existing medical conditions.

Areas with weak health infrastructure mostly developing countries will be the least able to cope without assistance to prepare and respond.

### **The Place of Home Economic Education in Climate Change**

The single most life-threatening challenge facing the world and human kind today and in the future is that of global warming and climate change. This is an inconvenient truth that the world humanity must now face up to and confront (former U.S. Vice president Al Gore) (Benitez 2007). It is a problem of both rich and the poor, of those who care and of those who do not care, it is a challenge that confronts human being. No body is immune from it, nobody can escape it, everybody has to face up to it. Home Economics has to be practical in the context of global warming and climate change, now and in the future. It

is an "inescapable" challenge (Benitez 2007).

Global warming and climate change ultimately have impact on the home and the family that lives in it and as home economics educators and practitioners, there is need to sustain the home and the family in this time of climate change.. There should be real workable ideas and solutions. Nigerian Home Economists under one umbrella, should create an appropriate enabling commission, task force, or working group on global warming and climate changes. This working group should be designated and empowered. It has to have a working programme with realistic activities and timelines. It has to actually work and make periodic reports to the Nigerian Home Economics Board. Resources and a secretariat should be allocated to the working group to support them.

The most important of the working group task should include:

1. A review of the Home Economics Curriculum to make it responsive to the challenge of global warming and climate change;
2. The contents and the way it should be taught;
3. Come up with a workable programme and timetable so that the new curriculum can be adopted by the educational system;
4. there will be need for campaign to convince policy and decision makers to authorize curricular and procedural changes in Home Economics so that the discipline will be responsive to the challenge

- of global warming and climate change;
5. there will be need to produce the teaching materials to support the new curriculum such as books, workbooks, manuals, teaching aids, laboratories and other educative tools in home economics. These should be made available to the students as well as teachers;
  6. Teachers should undertake seminars, workshops, conferences, training so that they can effectively teach the new course;
  7. The course should be coordinated and harmonized with the other courses and disciplines for instance, social studies, culture, history and physical and biological sciences for the effect to be total and synergistic.

Since the problem of global warming and climate change has been recognized humanity is primed to respond positively, Home Economics should not be left out. The proposed changes in the home economics curriculum that the study group would come up with should have a receptive audience. The task of educating and convincing the policy and decision makers will be easier as the challenges is well recognized.

Let us make home economics a catalyst in responding to the challenge of global warming and climate change.

## Conclusion

This article is about the effects of

global warming and climate change. The effects or impacts of climate change include physical, ecological, social or economic. Evidence of observed climate change includes the instrumental temperature record, rising sea levels, and decreased snow cover in the Northern Hemisphere, "Most of the observed increase in global average temperatures since the mid- 20<sup>th</sup> century is very likely due to the observed increase in human greenhouse gas concentration "(IPCC 2007 a 10). It is predicted that future climate changes will include further global warming (i.e. an upward trend in global mean temperature). Sea level rise, and a probable increase in the frequency of some extreme weather events.

## Recommendations

There is much Home Economists can adopt to carry out workplan along with other agencies such as WHO and UN in order to solve problems faced by climate change. These include:

- Advocacy-to raise awareness that climate change is a fundamental threat to human health;
- Partnerships to coordinate with partner agencies within the UN system, and ensure that health is properly represented in the climate agenda;
- Science and evidence to coordinate reviews of the scientific evidence on the links between climate change, and develop a global research agenda;
- Health system strengthening to assist the nation to assess their health vulnerabilities and build

- capacity to reduce health vulnerability to climate change;
- United Nations frame work convention on climate change should implement policies to reduce the emission of gases;
- Good sanitation should be adopted (encouraged) to reduce insects, vectors breeding around our living environment;
- Food should be made available, accessible and well utilized as well as safety of the food and water, proper-intra-household food distribution, taking into account the special food and nutritional needs of vulnerable groups;
- Exercise should be greatly encouraged;
- Protective clothing should be designed to protect the body/skin from ultraviolet rays of the sun and other environmental hazards.

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