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Global climate change

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Abstract: Climate change is one of the major risk of our life and adds considerable stress to our town and cities and to the environment. Weather patterns, food production to rising sea levels that increase the risk of baleful flooding the impacts of climate changes. The concept of global climate change, the associated terms, cause subsequences, dilution and its possible health impact. If we are to avoid an irreversible buildup of greenhouse gases and global warming at potentially huge cost to the economy and society worldwide. Climate change requires to know not only between countries, but also different levels of govermament, privates sector and individuals. The climate change is the back problem for all the peoples, there for many death according to climate change.

Key words: Global climate changes, greenhouse gases, natural and artificial factors.

1 INTRODUCTION

What is climate and weather

Weather is the state of the atmosphere at a specific time in a specific place. Temperature, cloudiness, humidity, precipitation, and winds are examples of weather elements. Thunderstorms, tornadoes, and monsoons are also part of the weather of some places during some seasons. Climate is defined as long-term weather patterns that describe a region. For example, the New York metro- politan region's climate is temperate, with rain evenly distributed throughout the year, cold winters, and hot summers

Climate is the average daily weather for an extend period of time at a certain location

1.1 Causes of climate changes

I. Natural cases
   a) volcanic eruptions
   b) ocean current

II. Human causes
   1) human activities
      a) burring of oil,
      b) fossils,
      c) deforestation,
      d) fertilizers.

Since the industrial revolution began in 1750 human activities have contribution substantially to climate change by adding carbon dioxide and other heat trapping gases to the atmosphere. These greenhouses gas emissions have increased the greenhouse effect causing earth's surface temperature to rise. Earth's temperature depends on the balance between energy entering and leaving the planet's system. When incoming energy from the sun is absorbed by the earths system earth warms

When the sun's energy is reflected back into space, earth avoids warming When absorbed energy is released back into the space, earth become cool.

Many factors both natural and human can cause changes in earth's energy balance including.

a- Variations in the sun's energy reaching earth

b- Changes in the reflectivity of earth's atmosphere and surface

c- Change in the greenhouse effect, which affects the amount of heat retained by earth's atmosphere.

Global climate change prior to the industrial revolution in the 1700 can be explained natural causes as changes in the solar energy, volcanic eruptions, and natural changes in the greenhouse gas concertation. Recent global climate change, however cannot be explained by natural causes alone as most research indicate that natural causes do not explain most observed warming since the mid-20th century. Humans are increasingly influencing the climate and the earth's temperature by burning fossils, fuels, cutting down rainforests and farming livestock. These human activities release large amounts of carbon dioxide which is the primary greenhouse gas in addition to those naturally occurring in the atmosphere, increasing the greenhouse effect and global warming.

Human activities have significantly disturbed the natural carbon cycle by extracting long-buried fossils, fuels and burning them for energy thus releasing carbon dioxide to the atmosphere. Global climate change also refers to the rise in average temperature on surface. Global climate change is due to primarily to the human use of fossils, fuels, which release carbon dioxide and other greenhouse gases into the air.

The gas trap heat within the atmosphere, which can have a range of effects on ecosystem. The primary cause of climate change is the burring of fossils, fuels such as oil and coal, which emits greenhouse gases into the atmosphere primarily carbon dioxide and other gases. Human activities, such as agriculture and deforestation, also contribute to the proliferation of greenhouse gases that cases climate change. While some quantities of the gases are naturally occurring and critical part of the earth temperature. Global climate change may effect by these five gases are

- ✓ CO_2
- ✓ H_2O
- ✓ CH_4
- ✓ N_2O
- ✓ CFCS

These gases occur in minute quantities in the atmosphere (as nitrogen and oxygen present 78% and 20.9% by volume respectively). Carbon dioxide contributes about 60% of total warming, whereas methane, CFCS and nitrogen 20%, 14% and 6% respectively. Besides these major greenhouse gases hydrogen chloro fluro carbons (HCFCS), Hydro fluro carbons (HFCS) halons, carbon tetrachloride and ozone unfortunately the

human activity has been making the blanket of greenhouse gases. Through the world carbon emissions from fossils, fuels burning have been increasing the global climate change. Due to increasing concentration of greenhouse gases has distributed the global climate system.

Nitrous oxide and other GHGS if emissions continue to grow at current rates it is almost certain that atmosphere levels of carbon dioxide will double from pre-industrial levels. The current century and it is quite possible that levels will triple by the year 2100.

The above mentioned greenhouse gases and human activities caused the global climate changes. Climate Variability and Climate Change Climate variability refers to variations in the prevailing state of the climate on all temporal and spatial scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system, or to variations in natural or anthropogenic (human-driven) external forcing. Global climate change in- dictates a change in either the mean state of the climate or in its variability, persisting for several decades or longer. This includes changes in average weather conditions on Earth, such as a change in average global tem- perature, as well as changes in how frequently regions experience heat waves, droughts, floods, storms, and oth- er extreme weather. It is important to note that changes in individual weather events will potentially contribute substantially to changes in climate variability. Climate change could occur naturally as a result of a change in the sun's energy or Earth's orbital cycle (natural climate forcing), or it could occur as a result of persistent anth- ropogenic forcing, such as the addition of greenhouse gases, sulfate aerosols, or black carbon to the atmosphere.

2 CLIMATE SYSTEM

Climate is a complex and interactive system. It consists of the atmosphere, land surface, snow and ice, oceans and other water bodies, and living beings. Among these, the first component, atmosphere characterizes climate. Various external factors influence the internal dynamics of the Climate Systems and these include natural phenomena such as volcanic eruptions and solar radiations, as well as human-induced changes in atmospheric composition. The entire climate system gets the power and energy from the Sun. The radiation balance of the Earth may get modified by three fundamental ways: 1) by changing the incoming solar radiation; 2) by changing the fraction of solar radiation that is reflected (called "albedo"); and 3) by altering the long wave radiation from Earth back towards space Climate, in turn, responds directly to such changes, as well as indirectly, through a va- riety of feedback mechanisms.

3 BRIEF HISTORY OF INTERNATIONAL AGREEMENTS ON CLIMATE CHANGE

For the first time in June 1988 at the World Conference on the Changing Atmosphere in Toronto, politicians and scientists conclude "humanity is conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to a global nuclear war." The conference recommends reducing carbon dioxide emissions 20% by 2005. In the same year IPCC published its First Assessment Report, which highlighted the increasing accumulation of human-made greenhouse gases in the atmosphere. The first Confe- rence of the Parties (1995) in Canada, realized the need of binding commitments by industrialized countries are required to reduce emissions. In December 1997 around 150 countries signed

the Kyoto Protocol, which binds 38 industrialized countries (called Annex 1 countries) to reduce greenhouse gas emissions by an average of 5.2% below 1990 levels for the period of 2008-2012. The Kyoto Protocol became international law on 16 February 2005. For any nation, the more urgent priorities like economic development always tends to take over threats like climate change or global environment change and this is why it is so difficult to achieve a coordinated interna- tional response to such issues. Recently, United Nations Climate Change Conference in Bali, Indonesia (De- cember, 2007) was attended by representatives from over 180 countries, together with observers from intergo- vernmental and nongovernmental organizations. Participants agreed on "Bali roadmap", which provide guide- lines to reach a treaty by the end of 2009 to replace the Kyoto Protocol. That year in April during the UN Cli- mate Talks in Bangkok – the first meeting after the Bali conference—an ambitious timetable had been devel- oped to complete the complex negotiations on a new climate deal in time for the UN Climate Conference in Copenhagen in December 2009Greenhouse Effect

4 GREENHOUSE EFFECT

A natural system known as the "greenhouse effect" regulates temperature on Earth. Just as glass in a greenhouse keeps heat in, our atmosphere traps the sun's heat near earth's surface, primarily through heat-trapping proper- ties of certain "greenhouse gases". Earth is heated by sunlight. Most of the sun's energy passes through the at- mosphere, to warm the earth's surface, oceans and atmosphere. However, in order to keep the atmosphere's energy budget in balance, the warmed earth also emits heat energy back to space as infrared radiation. As this energy radiates upward, most is absorbed by clouds and molecules of greenhouse gases in the lower atmosphere. These re-radiate the energy in all directions, some back towards the surface and some upward, where other mo- lecules higher up can absorb the energy again. This process of absorption and re-emission is repeated until, fi- nally, the energy does escape from the atmosphere to space. However, because much of the energy has been re- cycled downward, surface temperatures become much warmer than if the greenhouse gases were absent from the atmosphere. This natural process is known as the greenhouse effect. Without greenhouse gases, Earth's av- erage temperature would be −19˚C instead of +14˚C, or 33˚C colder. Over the past 10,000 years, the amount of greenhouse gases in our atmosphere has been relatively stable. Then a few centuries ago, their concentrations began to increase due to the increasing demand for energy caused by industrialization and rising populations, and due to changing land use and human settlement patterns**.**

5 GREENHOUSE GASES

Carbon dioxide or CO2 is the most significant greenhouse gas released by human activities, mostly through the burning of fossil fuels. It is the main contributor to climate change. Methane is produced when vegetation is burned, digested or rotted with no oxygen present. Garbage dumps, rice paddies, and grazing cows and other livestock release lots of methane Nitrous oxide can be found naturally in the environment but human activities are increasing the amounts. Nitrous oxide is released when chemical fertilizers. Nitrous oxide is released when chemical fertilizers and ma- nure are used in agriculture. Halocarbons are a family of

chemicals that include CFCs (which also damage the ozone layer), and other human-made chemicals that contain chlorine and fluorin

6 CAUSES OF GLOBAL CLIMATE CHANGE

Earth's climate changes naturally. Changes in the intensity of sunlight reaching the earth cause cycles of warm-ing and cooling that have been a regular feature of the Earth's climatic history. Some of these solar cycles—like the four glacial-interglacial swings during the past 400,000 years—extend over very long time scales and can have large amplitudes of 5˚C to 6˚C. For the past 10,000 years, the earth has been in the warm interglacial phase of such a cycle. Other solar cycles are much shorter, with the shortest being the 11 year sunspot cycle. Other natural causes of climate change include variations in ocean currents (which can alter the distribution of heat and precipitation) and large eruptions of volcanoes (which can sporadically increase the concentration of atmos- pheric particles, blocking out more sunlight). Still, for thousands of years, the Earth's atmosphere has changed very little. Temperature and the balance of heat-trapping greenhouse gases have remained just right for humans, animals and plants to survive. But today we're having problems keeping this balance. Because we burn fossil fuels to heat our homes, run our cars, produce electricity, and manufacture all sorts of products, we are adding more greenhouse gases to the atmosphere. By increasing the amount of these gases, we have enhanced the warming capability of the natural greenhouse effect. It's the human-induced enhanced greenhouse effect that causes environmental concern, because it has the potential to warm the planet at a rate that has never been expe- rienced in human history.

7 CONSEQUENCES OF GLOBAL CLIMATE CHANGE

Although the consequences of climate change could be discussed under a number of different categories, the scope of this discussion limits it to both natural and economic consequences.

7.1 Natural Consequences

These are already visible, for instance, temperatures are rising, polar caps are melting, sea level is rising, the de- sertification increases and the winters in Europe become ever wetter. It has been scientifically demonstrated that Mount Kilimanjaro through the years contains less and less snow as a consequence of global heating. It is ques- tionable whether this mountain in Tanzania will be covered with snow at all in 50 years. It is also concluded that the number of natural disasters increases more and more. Tsunamis, floods and extreme drought occur morefrequent than in times past. In the period 1950-1960 worldwide 13 natural disasters have been registered, against 72 in the period 1990-1998. Now already the consequences are clearly demonstrable and most likely they will only increase in extent and frequency in the future. The IPCC predicts that climate change will become apparent in the following main ways: • By around 2100 global temperatures will have risen by between 1.1˚C and 6.4˚C. The exact increase de-pends on future emissions of greenhouse gases and other pollutants and on the combined action of physical and chemical processes in the atmosphere. • Some parts of the world will receive more precipitation, with others becoming drier. • In the course of the present century sea levels will rise by between 18 and 59 centimetres. This is because warmer water occupies more space than cold water and because of the retreat of glaciers and polar ice sheets. Our understanding of the melting of the Greenland and Antarctic ice sheets is still incomplete. This, together with the fact that there

may be large regional variations in sea level rise, means that in some parts of the world the consequences may be even more dramatic than predicted by IPCC. • The Gulf Stream, which transports relatively warm water from the Caribbean to Europe, is expected to de- cline in strength, causing temperatures in northwest Europe to rise less markedly than elsewhere. Standard climate models, however, make no allowance for an abrupt change in the Gulf Stream

7.2 Economic Consequences

Changes in global climate will have enormous consequences for living nature as well as the economy. Even a small rise in mean annual temperature can have a major impact on a region's ecology and biological diversity (Pounds & Puschendorf, 2004). Biodiversity is of crucial importance for the stability of ecosystems as well as for human health (Harvard, 2002). 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% and 20% of global income (Stern, 2006). The IPCC has not yet managed to provide a rock-solid cost estimate of the conse- quences 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% instead of 60%, 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 Health Impacts of Climate Change

Global climate change would affect human health via pathways of varying complexity, scale and directness and with different timing. Similarly, impacts would vary geographically as a function both of environment and to- pography and of the vulnerability of the local population. Impacts would be both positive and negative (although expert scientific reviews anticipate predominantly negative). This is no surprise since climatic change would disrupt or otherwise alter a large range of natural ecological and physical systems that are an integral part of Earth's life support system. Via climate change humans are contributing to a change in the conditions of life on Earth.

The more direct impacts on health include those due to changes in exposure to weather extremes (heatwaves, winter cold); increases in other extreme weather events (floods, cyclones, storm-surges, droughts); and increased production of certain air pollutants and aeroallergens (spores and moulds). Decreases in winter mortality due to milder winters may compensate for increases in summer mortality due to the increased frequency of heatwaves. In countries with a high level of excess winter mortality, such as the United

Kingdom, the beneficial impact may outweigh the detrimental (Langford & Bentham, 1995; Rooney et al. 1998). The extent of change in the fre- quency, intensity and location of extreme weather events due to climate change remains uncertain. Climate change, acting via less direct mechanisms, would affect the transmission of many infectious diseases (especially water, food and vector-borne diseases) and regional food productivity (especially cereal grains). In the longer term and with considerable variation between populations as a function of geography and vulnerabil-ity, these indirect impacts are likely to have greater magnitude than the more direct (McMichael & Githeko, 2001; Epstein, 1999). 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). By reflecting the increased retention of heat energy in the lower atmosphere, global warming also affects the atmospheric heat budget so as to increase the cooling of the stratosphere (Shindell et al., 1998) Should this cooling persist, the process of ozone depletion could continue even after chlorine and bromine loading (by hu- man emission of ozone-destroying gases) starts to decline. If so, the potential health consequences of stratos- pheric ozone depletion (increase in incidence of skin cancer in fair-skinned populations; eye lesions such as cat- aracts; and, perhaps, suppression of immune activity) would become an issue for climate change.

9 RESULT

Impact of global climate change are occurring now, nevertheless, the result is that natural system around the world are being affected by regional global climate change, particularly temperature increase are very likely to be the result of anthropogenic emission of greenhouse gases and human activities.

10 CONCLUSION

Climate change is happening and it is caused by human activities. The increasing rate of global warming-courtesy of carbon dioxide and other greenhouse gases emission from human activities-have led to global climate change and environment degradation which in turn have resulted to great challenges in relation to diseases and human health.

Condition further many global climate change caused by natural factor and artificial factors, natural factor include volcanic eruptions, ocean current, earth orbital change, solar variations and forest fire. Artificial factors including human activities emission of greenhouse gases and solar radiation, global climate change effect on sea level rising, global temperature rising, health risk and arctic sea ice loss.

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