



Global Warming & Climate Change – Cause of Concern With Special Reference to Indian Scenario

G. Kumar

Professor & Head, Geology
BIT Sindri, P.O. Sindri Institute, Dhanbad – 828 123, Jharkhand

ABSTRACT

Global warming is the increase of Earth's average surface temperature due to greenhouse gases, such as carbon dioxide emissions from burning fossil fuels or from deforestation, which trap heat that would otherwise escape from Earth.

With the start of industry in the 1700's, humans began emitting more fossil fuels from coal, oil, and gas to run our cars, trucks, and factories. U.S. emits approximately 6 billion tons of carbon dioxide every year. 40% of that comes from

power plant emissions alone. Since 1870, global sea levels have risen by about 8 inches. Consequences of global warming include drought, severe hurricanes, massive fires and melting of the polar caps. Over all global temperature in has increased by 2 degrees in the last 50 years and precipitation by 5%. Global warming also puts coral reefs in danger.

In this paper, an attempt has been made to discuss this pertinent issue with special reference to Indian scenario.

KEYWORDS : greenhouse gases, fossil fuels, global warming, coral reefs, hurricanes

INTRODUCTION

Man may or may not be driving it. Given the uncertainties, a significant amount of global regret may apply if we divert too much of our global wealth to solving what may be a non-existent or trivial problem, especially if that diversion mires billions in poverty. On the other hand, we may also regret not doing anything if man-made global warming does turn out to be a problem. It is therefore prudent to examine what steps we can take that would prove beneficial whether or not anthropogenic global warming turns out to be a problem. These steps can be termed “no regrets” policies, Spengler, et.al. (1983).

What makes a No Regrets Global Warming Policy? A global warming policy can be termed “no regrets” as long as it:

- Reduces the amount of greenhouse gases emitted into the atmosphere, or
- Mitigates, prevents or reduces a harm associated with global warming, or
- Provides greater capacity for dealing with problems associated with global warming
- Without imposing significant cost or diverting economic activity.

Top Five “No Regrets” Policies

- 1.) Eliminate all subsidies to fuel use.
- 2.) Repeal the Federal Flood Insurance Program.
- 3.) Reform Air Traffic Control Systems.
- 4.) Facilitate Electricity Competition.
- 5.) Reduce Regulatory Barriers to New Nuclear Build.

There is no other technology than nuclear that is proven to be capable of providing emissions-free energy at the scale required to make significant reductions in carbon emissions. The problem is that thanks to anti-nuclear activism by environmentalists in the 1970s, it takes a very long time to build a nuclear plant. This pushes development and construction costs up to the level where it is not economically competitive with higher-emitting forms of electricity generation like coal and natural gas, Wong et.al.(2008). According to the nuclear energy institute, it takes 10 years from concept to operation to build a nuclear plant, and only four of those are construction, the rest is permit application development (2 years) and decision-making by the Nuclear Regulatory Commission (4 years).

ENERGY NEEDS V. GLOBAL WARMING GOALS

Leading climate alarmists claim that global greenhouse gas emissions need to decrease to 60 percent below present levels by 2050 if humans are to avoid catastrophic climate change. But such a drastic emissions reduction is at odds with the world's energy needs. Economists predict that an 80 percent increase in global energy demand will cause global greenhouse gas emissions to grow by 70 percent by mid-century.

THE COST OF GLOBAL WARMING

Dr. William Nordhaus of Yale University estimates that 3°C of global warming would cost the world \$22 trillion this century. Al Gore's package of measures, which calls on the U.S. to “join an international treaty within the next two years that cuts global warming pollution by 90 percent in developed countries and by more than half worldwide in time for the next generation to inherit a healthy Earth,” would reduce warming costs to \$10 trillion, at a cost of \$34 trillion.

Climate change might harm human welfare, but so would climate change policy. Policy makers should assess and weigh both sets of risks before deciding on a course of action, Harris G. (2014).

A “planetary emergency—a crisis that threatens the survival of our civilization and the habitability of the Earth”—that is how former Vice President Al Gore describes global warming. Most environmental groups preach the same message. So do many journalists. So do some scientists.

In fact, at the 2008 annual meeting of Nobel Prize winners in Lindau, Germany, half the laureates on the climate change panel disputed the so-called consensus on global warming, Chambers, B. (2014).

THE GREENHOUSE EFFECT

We have probably heard the dire warnings many times. Carbon dioxide (CO₂) from mankind's use of fossil fuels like coal, oil, and natural gas is building up in the atmosphere. Carbon dioxide is a greenhouse gas—it traps heat that would otherwise escape into outer space. Al Gore warns that global warming caused by carbon dioxide emissions could increase sea levels by 20 feet, spin up deadly hurricanes. It could even plunge Europe into an ice age, Goswami et.al.(2006).

Science does not support these and other scary predictions, which Gore and his allies repeatedly tout as a “scientific consensus.” Global warming is real and carbon dioxide emissions are contributing to it, but it is not a crisis. Global warming in the 21st century is likely to be modest, and the net impacts may well be beneficial in some places. Even in the worst case, humanity will be much better off in 2100 than it is today.

The following is a summary of key points:

- Average Annual Heat-Related Mortality: People will not drop like flies from heat waves in a warming world. Heat-related mortality will continue to decline as the world warms.
- Average Annual Heat-Related Mortality
- Far more people die each year from excess cold than from excess heat.
- Global warming will not make air pollution worse.
- Global warming will not lead to malaria epidemics in Northern Hemisphere countries.
- Contrary to Gore, no “strong, new scientific consensus is emerg-

ing" that global warming is making hurricanes stronger.

- Global Death & Death Rates Due to Extreme Events, 1900-2004: Since the 1920s, death rates related to extreme weather declined by more than 98 percent globally. The impression conveyed by An Inconvenient Truth—that global warming is making the world a more dangerous place—is false.

CLIMATE CHANGE IMPACTS IN INDIA

Climate change impacts in India may be speculated as given below :

- Frequency of hot days and multiple-day heat waves have increased in past century; **Increase in deaths due to heat stress in recent years.**
- The entire Himalayan **Hindu Kush ice mass has decreased in the last two decades** and the ratio of melt accelerates. Hence, water supply in areas fed by HKH glacier melt, on which hundreds of millions of people in China and India depend, will be negatively affected.
- **Serious and recurrent floods in Northeast states of India during 2002, 2003 and 2004;** A record 944 mm of rainfall in Mumbai on 26-27 July 2005 led to loss of over 1000 lives with loss of more than US\$250 millions; Floods in Surat, Barmer and in Srinagar during summer monsoon season of 2006.
- **Sea-level rise leads to intrusion of saline water into the fresh groundwater** in coastal aquifers and thus adversely affects groundwater resources. For two small and flat coral islands at the coast of India, the thickness of freshwater lens was computed to decrease from 25 m to 10 m and from 36 m to 28 m, respectively, for a sea level rise of only 0.1 m.
- Ganges-Brahmaputra delta (also Bangladesh): **More than 1 million people will be directly affected by 2050 from risk through coastal erosion and land loss**, primarily as a result of the decreased sediment delivery by the rivers, but also through the accentuated rates of sea-level rise.
- Warmer climate, precipitation decline and droughts in most delta regions of India have resulted in **drying up of wetlands and severe degradation of ecosystems.**
- **The gross per capita water availability in India will decline** from ~1820 m³/yr in 2001 to as low as ~1140m³/yr in 2050.

MEASURES TO PROTECT AGAINST CLIMATE CHANGE

- WWF-India is leading a regional project with WWF-Nepal on impacts of freshwater ecosystems in the Himalayas including assessment and monitoring of key glaciers and glacial lakes.
- In addition, WWF-India is developing and implementing adaptation strategies in selected sites (ecosystems and vulnerable communities) of the Ganga river.
- WWF is determining how protected areas will be affected by climate change in the region, especially sea level rise. The goal is to determine those islands having tiger populations which are at risk due to rise in sea level

THE SUNDARBANS

The Sundarbans is the largest mangrove forest in the world and it extends across southern

Bangladesh and India's West Bengal state. It lies in the vast delta formed by the confluence of the Ganges, Brahmaputra, and Meghna rivers. The WWF-India Climate Change Programme is conducting an assessment of sea-level rise in the Sundarbans, concentrating on impacts on local livelihoods and the habitat of the tiger.

OUR EARTH

- *To better understand the risks of climate change to development, the World Bank Group commissioned the Potsdam Institute for Climate Impact Research and Climate Analytics to look at the likely impacts of temperature increases from 2°C to 4°C in three regions. The scientists used the best available evidence and supplemented it with advanced computer simulations to arrive at likely impacts on agriculture, water resources, cities and coastal ecosystems in South Asia, South East Asia and Sub-Saharan Africa. Some of their findings for India include:*

What we know India is already experiencing a warming climate.

What could happen Unusual and unprecedented spells of hot weather are expected to occur far more frequently and cover much larger areas.

Under 4°C warming, the west coast and southern India are projected to shift to new, high-temperature climatic regimes with significant impacts on agriculture.

What can be done With built-up urban areas rapidly becoming "heat-islands", urban planners will need to adopt measures to counteract this effect.

CHANGING RAINFALL PATTERNS

What we know A decline in monsoon rainfall since the 1950s has already been observed.

The frequency of heavy rainfall events has also increased.

What can be done Improvements in hydro-meteorological systems for weather forecasting and the installation of flood warning systems can help people move out of harm's way before a weather-related disaster strikes.

Building codes will need to be enforced to ensure that homes and infrastructure are not at risk.

DROUGHTS

What we know Evidence indicates that parts of South Asia have become drier since the 1970s with an increase in the number of droughts. Droughts have major consequences. In 1987 and 2002-2003, droughts affected more than half of India's crop area and led to a huge fall in crop production.

What can be done Investments in R&D for the development of drought-resistant crops can help reduce some of the negative impacts.

GROUNDWATER

What we know More than 60% of India's agriculture is rain-fed, making the country highly dependent on groundwater. Even without climate change, 15% of India's groundwater resources are overexploited.

What can be done The efficient use of ground water resources will need to be incentivized.

GLACIER MELT

What we know Most Himalayan glaciers - where a substantial part of the moisture is supplied by the summer monsoon - have been retreating over the past century.

What can be done Major investments in water storage capacity would be needed to benefit from increased river flows in spring and compensate for lower flows later on.

SEA LEVEL RISE

What we know Mumbai has the world's largest population exposed to coastal flooding, with large parts of the city built on reclaimed land, below the high-tide mark. Rapid and unplanned urbanization further increases the risks of sea water intrusion.

What can be done Building codes will need to be strictly enforced and urban planning will need to prepare for climate-related disasters. Coastal embankments will need to be built where necessary and Coastal Regulation Zone codes enforced strictly.

AGRICULTURE AND FOOD SECURITY

What we know Even without climate change, world food prices are expected to increase due to growing populations and rising incomes, as well as a greater demand for biofuels.

What can be done Crop diversification, more efficient water use, and improved soil management practices, together with the development of drought-resistant crops can help reduce some of the negative impacts.

ENERGY SECURITY

What we know Climate-related impacts on water resources can undermine the two dominant forms of power generation in India - hydropower and thermal power generation - both of which depend on adequate water supplies to function effectively.

What can be done Projects will need to be planned taking into account climatic risks.

WATER SECURITY

What we know Many parts of India are already experiencing water stress. Even without climate change, satisfying future demand for water will be a major challenge. Urbanization, population growth, economic development, and increasing demand for water from agriculture and industry are likely to aggravate the situation further.

What can be done Improvements in irrigation systems, water harvesting techniques, and more-efficient agricultural water management can offset some of these risks.

HEALTH

What we know Climate change is expected to have major health impacts in India- increasing malnutrition and related health disorders such as child stunting

- with the poor likely to be affected most severely.

What can be done Improvements in hydro-meteorological systems for weather forecasting and the installation of flood warning systems can help people move out of harm's way before a weather-related disaster strikes. Building codes will need to be enforced to ensure that homes and infrastructure are not at risk.

MIGRATION AND CONFLICT

What we know South Asia is a hotspot for the migration of people from disaster-affected or degraded areas to other national and international regions.

What can be done Regional cooperation on water issues will be needed.

CONCLUSIONS

Those observations and conclusions note that global warming will lead to the following situations, amongst others:

- Rapid global heating according to a US National Academy of Science warning
- Dramatic increase in greenhouse gas emissions
- Ozone loss aggravated by global warming
- Ozone loss likely to aggravate global warming
- Warming of the oceans leads to increased greenhouse gases
- Permafrost thawing will aggravate global warming
- Oceanic changes observed that may aggravate the situation
- A vicious circle whereby each problem will exacerbate other problems which will feedback into each other
- Massive extinction of species will aggravate the environmental crisis
- Sudden collapse of biological and ecological systems may occur, but will have a very slow recovery
- While effective measures can decrease global warming and other problems the World community has repeatedly failed to establish cooperation
- Water expands when heated, and sea levels are expected to rise due to climate change

Rising sea levels will also result as the polar caps begin to melt

- Rising sea levels is already affecting many small islands
- The *World Watch Institute* reports that "the Earth's ice cover is melting in more places and at higher rates than at any time since record keeping began
- Rising sea levels will impact many coastlines, and a large mass of humanity lives near the coasts or by major rivers. Analysis by the World Wildlife Fund has found that many cities are unprepared for climate change effects such as rising sea level

REFERENCES

1. Chambers, B. (2014). The Ugly Truth about Garbage and Island Biodiversity; Executive | Secretary of the United Nations Environment Program. |
2. Goswami B N, Venugopal V, Sengupta D, Madhusudan M S & ,Xavier P K(2006). | Increase Trend of Extreme Rain Events Over India Warming Environment, Science, 314 p -1442-1446. | 3. Harris G. (2014). "New York Times International Weekly"; 2nd February. | 4. Spengler, John D. & Sexton, K. A. (1983). "Indoor Air Pollution: A Public Health | Perspective". Science 221 (4605): 9-17 [p. 9]. | 5. Wong CM, Vichit-Vadakan N, Kan H, Qian Z.(2008) "Public Health and Air Pollution in Asia (PAPA): a multicity study of short term effects of air pollution on mortality: a national analysis." Environmental health perspectives.;116(9):1195.