



Global warming-Green house effect

A. P. Palanichamy

Department of Economics, Government Arts College, Thiruvannamalai-606 603, TN, India

logeshwar67@yahoo.com; logeshwar_67@yahoo.com

Abstract

Global warming refers to an average increase in the earth's temperature, which in turn courses in climate, Contribution of green house gases to floral warming, carbon dioxide, methane, Chloro-Fluro-Carbon (CFCs) and Nitrous oxides act like a green house, warming the earth surface. The rise in earth's temperature due to increase in carbon dioxide emission has been speculated since 1800's and its effect house been analysed for almost a century. The foremost cause for transformation of global environment is the ever increasing number of human beings since 1990, the number of people has more than tripled. According to UN projection, the global population increased from 205 billion to 5 billion in less than four decades (i.e.) from 1950 to 1990 and is expected to reach 10 billion by the end of next century. Developing countries account for only 1.29 billion tones of CO₂ emission 1985 and projected increase for 2005 in 5.47 billion tones of carbon oxide was emitted with is projected to increase to 12.18 billion tones by 2025. The CO₂ emissions are projected to increase by 2.6 percent annually.

Keywords: Climate change, green house effect, global population, CO₂ emission.

Introduction

The planet earth is estimated to be 5 billion years old and it has been nurturing biological species for more than 3.5 billion years. During this period, the earth has endured many types of bombardments meters and resuming of mountains etc. As human beings, we cannot completely disrupt the earth systems but affect it significantly in recent centuries, in our quest for good clothing and shelter. The far most cause for transformation of global environment is ever increasing number of human basis. Since 1900, member of people has more than tripled. According to UN projections, the global population increased from 2.5 billion to 5 billion in less than four decades i.e. form 1950 to 1990, and is expected to reach to billion by the end of next century. The worst hit will be hundred of millions of small scale farmers, fishers and forest dependent people who are already vulnerable and food insecure. By affecting the availability of land, water and bio-diversity and the price of food, the rising demand for bio fuels, produced from food crops also has an impact on the poor. Developing countries on the other hand account for only 1.29 billion tones of CO₂ emission 1985 and projected increase for 2005 in 5.47 billion tones of carbon oxide was emitted with is projected to increase to 12.18 billion tones by 2025. The CO₂ emissions are projected to increase by 2.6 percent annually. USA is the largest contributor globally accounting for nearly 18 percent. Data for 1985 suggests that the developed countries contribution to CO₂ emission was 3.95 billion cones and this is expected to rise to 6.71 billion tones by 2025.

Methods of the study

The present increase in population must 1 - 50 years equals to total increase in the world population from the time human species first emerged until the middle of this

century. This paper mainly focused on secondary data from the various sources of government of publications. Though the phenomenon is explained by demographers through their theory of demographic transition, the fact remains that there has been population explosion with 50 years all over the globe, causing tremendous strain on the resources of the earth and pollution of the biosphere

- | | | |
|--|---|------------------------------------|
| 1. $\frac{49}{100} \times 360 = 176.4^\circ$ | → | O ₂ |
| 2. $\frac{18}{100} \times 360 = 64.8^\circ$ | → | Methane (CH ₄) |
| 3. $\frac{14}{100} \times 360 = 50.4^\circ$ | → | CFCs |
| 4. $\frac{6}{100} \times 360 = 21.6^\circ$ | → | Nitrous oxide |
| 5. $\frac{13}{100} \times 360 = 46.8^\circ$ | → | Others
(ozone carbon monoxides) |

Carbon dioxide, methane chloro-fluro-carbon (CFCs) and nitrous oxides act like a green house, warming the earth surface. Hence the term 'green house effect'. Carbon dioxide is the most important of the green house gases. The rise in earth's temperature due to increase in carbon dioxide emission has been speculated since 800's and its affect have been analyzed for almost a century.

Least square analysis

$$Y = a+bx \quad a = \frac{\sum xy}{\sum x^2} = \frac{4.14}{2} = 2.70$$

The trend value 2020s will be $y = 3.28 + 2.70 (-1) = 3.28 - 270 = 0.58$

The trend value 2050s will be $y = 3.28 + 2.70 (0) = 3.28$

The trend value 2080s will be $y = 3.28 + 2.70 (1) = 3.28 + 270 = 5.98$



Impact of predicted climate change on agriculture

The climate change will affect crop yields and cropping pattern due to direct effects of changes in atmospheric concentration of green house gases in general and CO₂ in particular. Carbon dioxide is a perfect example of a change that could have both positive and negative effects. Carbon dioxide is expected to have positive physiological effects through increased photosynthesis. This impact should be higher on C₃ crops such as wheat and rice than in CO₄ plants like maize and grasses. The direct effects of changes in CO₂ concentration will be through the changes in soil moisture and infestation by pests and diseases because of rising temperature and relative humidity. Such indirect effects through the increase in temperature will reduce crop duration, increase crop respiration rates, increase evapo transpiration, decrease fertilizer use efficiencies and enhanced pest infestation. Possible impact of climate change on wheat production in India has been worked out by climate surrises for the period between 2000 to 2070 and is reproduced in figure 1.

Semi average method:

$$\frac{76 + 75 + 74 + 73}{4} = \frac{298}{4} = 74.5 \text{ MT}$$

$$\frac{72 + 70 + 66 + 58}{4} = \frac{266}{4} = 66.5 \text{ MT}$$

Table 1. Contribution of green house gases of global warming.

GAS	Sources	Proportionate contribution to global warming	Pie diagrams
CO ₂	Deforestation cement production fossil combustion	49 %	176.4°
Methane (CH ₄)	Bacterial activity in paddy fields	18 %	64.8°
CFCs	Refrigeration insulation and other industrial proposes	14 %	50.4°
Nitrous oxide	Fertilizers, land clearings, biomass burning	6 %	21.6°
Other (Ozone Carbon monoxides)	Various	13 %	46.8°

Source: The Kisan World Feb. 2008.

From Fig. 1 that there is general consensus that the yield of main season (Kharif) crop will increase due to the effect of higher carbon dioxide levels. However, a large yield decrease is predicted for the Rabi crops because of increased temperatures. One of the potential effects of climate change on agriculture will be the shifts in the sowing time and length of growing seasons, which would alter sowing and harvesting dates of plants, crops and varieties, high temperature induced higher evapo transpiration would call for much greater efficiency of water and nutrients. Change in weeds of flora and pests would require special methods of

management and control and a great challenge for scientific community. There may also be a shift in climatic zones due to increased temperatures.

Table 2. Climate change projections for India.

Year	Season	Temperature change (°C)		Rainfall change (°C)	
		Lowest	Highest	Lowest	Highest
2020s	Annual	1.00	1.41	2.16	5.97
	Rabi	1.08	1.54	-1.95	4.36
	Kharif	0.87	1.17	1.81	5.10
2050s	Annual	2.23	2.87	5.36	9.34
	Rabi	2.54	3.18	-9.22	3.82
	Kharif	1.81	2.37	7.18	10.52
2080s	Annual	3.53	5.55	7.48	9.90
	Rabi	4.14	6.31	-24.83	-4.50
	Kharif	2.91	4.62	10.10	15.18

Source: Lal (2001) Intensive Agriculture, 2008

Impact on global warming

Global warming is expected to bring about a rise in the sea level because of the expansion of sea water caused by the melting glaciers and perhaps the melting of solar ice with a rise in temperature.

1. The effect would increase flooding of many of the coastal wet lands. This coastal erosion is expected to create shoreline loses of between 10 and 100 feet depending on local conditions.
2. The effect would increase ambient temperature and cause climate change affecting the agriculture.
3. It would decrease rain fall and water scarcity.
4. The higher global temperature would accelerate water to evaporate more from the oceans.
5. Due to melting of polar ice-caps the flora and fauna of the ecosystem likely to be affected
6. Greenland melts to release 250 cubic km of water each year, adding to the rising sea levels.
7. With the melting permafrost in the arctic buildings and roads in Alaska and Siberia are suffering severe damages.
8. The year 2005, monsoon in Mumbai killed over 750 people when showered nearly a meter of rainfall.
9. The devastating hurricane Katrina which hit New Orleans, was one of the strongest Atlantic storms ever observed in 24 hours, the highest ever recorded.
10. In 2003 severe heat left nearly 30,000 people dead across Europe. The situation was so bad that in Paris, because morgues were overflowing, dead bodies were kept in vegetable cooling warehouses.

International concern the Kyoto protocol

Ever since the threat of climate change solidified, its presence in the minds of the powers that be international consensus exists on the absolute necessity to take measures to compact global warming. To this end, the United Nations Framework Convention on Climate Change (UNFCCC) was signed in 1992 at the



Table 3. The trend value analysis.

Year	Highest temperature change (° C)	x	x ²	y	y=a+bx
2020 _s	1.41	-1	1	-1.41	0.58
2050 _s	2.87	0	0	0	3.28
2080 _s	5.55	1	1	5.55	5.98
N	Σy = 9.85	Σx = 0	Σx ² = 2	Σxy = 4.14	

Table 4. Possible impact of climate change on wheat production in India.

Year	Production (in million Tons)
2000	76
2010	75
2020	74
2030	73
2040	72
2050	70
2060	66
2070	58

Rio earth summit by 150 nations, with George Bush senior at the helm of affairs for the united states. Subsequently, the Kyoto protocol was reviewed again in Japan in 1997. At this time industrialized developed nations took the commitment to take the lead in combating climate change, since they were the highest polluters. In accordance with the agreement, the target was to achieve an aggregate fall of greenhouse emission by 12% by 2012.

Summary and conclusion

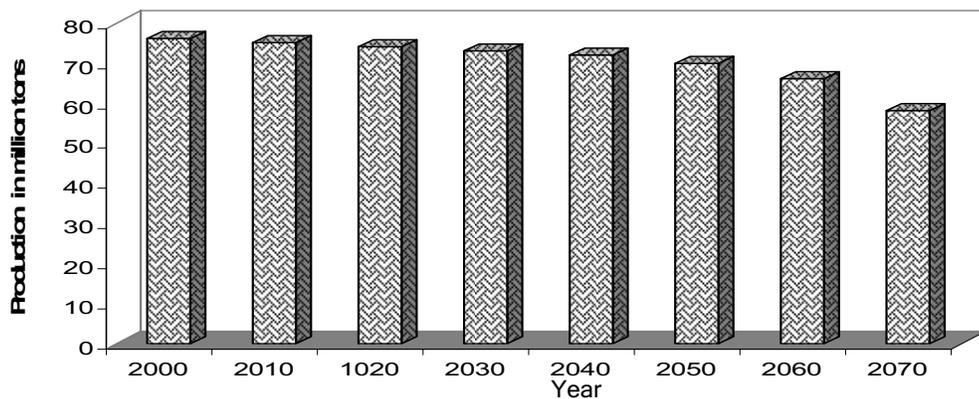
Much can be done to reduce agriculture contribution to green house gas emissions and it is important to pursue strategies and practices with this end in view. However, mitigation alone is not enough and will not be felt before the second half of the century. Global warming is already underway and adoption strategies are now a matter of urgency, especially for the most vulnerable poor countries. Humanity must learn to live with climate change. But we cannot allow climate

change to become one more aggravating factor for hunger in the world as it can widen the gap between rich countries and poor countries. The future will be extreme weather events drought and rising sea level threaten the lives and livelihoods of millions of people around the world. There is a need for a collective effort by the international community to fight this problem. It also means that knowing what the climate will be in the next fifty or one hundred years is among the most challenging problems to science.

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Fig. 1. Possible impact of climate change on wheat production.



Source: Intensive agriculture (July-Dec-2008)