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EFFECT OF GLOBAL WARMING ON MONSOON (With Special Reference to Chhattisgarh Region)

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ABSTRACT

The effect of global warming is increasing the average temperatures of the earth. A rise in earth's temperatures can in turn root to other alternation of ecology including sea level and modifying the quantity and pattern of rain fall. This modification may boost the occurrence and concentration of severe climate events such as floods famines, heat waves tornados and twisters. There are number of spaces that have a threat of disappearing soon as an effect of global warming. Scientists all over the world are making prediction about the ill effect of global warming and connecting some of the events that have taken place in the PAST FEW DECADES as an alarm of global warming. The Intergovernmental panel on climate change (IPCC) conclusion that increasing greenhouse gas concentration resulting from human activities such as fossils fuel burning and deforestation are responsible for most of the observed temperature increase since the middle of 20th century. As of June 2009, only the United State historically the world's largest emitter of green house gases which is main cause of global warming has refused to rectify the KYOTO PROTOCOL treaty. In Chhattisgarh Region gradual decrease in Rain fall has been seen since last 50 years due to global warming. During the last 5 decades the average rainfall in Chhattisgarh region has fallen down from 1301 milimeter to 1150 millimeter .In Chhattisgarh region the arrival of monsoon every year has been noted the 2nd week of June but this year monsoon arrived on 22nd June 2009, this monsoon word is derived from ARABIC WORD MOUSIM. Recently the scientists have prepared a VISUAL ALTAS to know where the rain falls have occurred. This visual atlas has been prepared by international team led by National University of Australia.

Introduction :- Global warming is the increase in the average temperature of the earth near-surface air and ocean since the mid-20th century and its project continuation. A rise in the earth temperatures can turn in root to other allocations in the ecology including an increasing sea level and modifying the *quantity and pattern of rainfall*. The latest **Intergovernmental Panel on Climate Change [IPCC]** report indicates that the global surface temperature will probably rise a **further 1.1 to 6.4 °C (2.0 TO 11.5 °F)** during the 21st century. [According to climate model]. The monsoon word is

derived from ARABIC word MOUSIM. Monsoon is a seasonal wind which run's continuously months together. At first use of monsoon word has been used with reference to RAINFALL of seasonal winds by INDIA, PAKISTAN, BANGLADESH AND OTHER NEBOURING COUNTRIES FROM INDIAN & ARABIC OCEAN. As per the information available the beginning of ASIAN MONSOON is **5 crore years** ago, when the Tibetan plateau arose after the collision of Indian and Asian landscape.

Global Warming : Global Warning : Global

warming is the observed and projected increases in the average temperatures of earth's atmosphere & ocean. The earth's average temperature rose about 0.6°C Celsius (1.1°C Fahrenheit) in the 20th century. **The IPCC concludes** that variation in natural phenomena such as **solar radiation** and **volcanoes** produced most of the warming from pre-industrial times to 1950's and small cooling effect afterwards temperatures increase in the last 150 year up to 0.6°C. **IPCC Fourth Assessment report** projects that by the **end of 21st century** global average surface temperature will increase by **1.8°C to 4°C**.

Global Warming Prediction : According to different assumption about the future behavior of mankind , a projection of current trend as represented by number of different scenario gives temperature increase of about **3°C to 5°C (5 to 9 Fahrenheit)** by the **year 2100 or soon afterward** . A 3°C or 5° Fahrenheit rise would likely raise **sea level by about 25 meter (about 82feet)**

Visualatlas :-The scientists have prepared an ATLAS which will show the condition of rain fall in different part of the world. According to them they are of the firm opinion that until the next century the rainfall can be estimated through this ATLAS and in this connection Dr. **Michael Roderick** has ascertained that where will rainfall occurs and where will the droughts occurs in different parts of the globe,. This ATLAS is prepared by the international team led by the **national university of Australia**.

Objective of the Study :- 1. The main objective of the study is to find out the impact of global warming on **monsoon of Chhattisgarh**. 2. To find out **decreasing rainfall trends in 5 decades in Chhattisgarh region**. 3. To find out the impact and causes of Global Warming on Environment. 4. To find out the trends of raising temperature on earth ocean in near future.

Research Methodology :-

- 1. Collection of data:** - The study is based on secondary data.
- 2. Sources of data:** - The data were collected from the various Journals magazine, Newspapers and related website.
- 3. Technique of analysis:**-The technique of analysis for this research is Trend analysis.

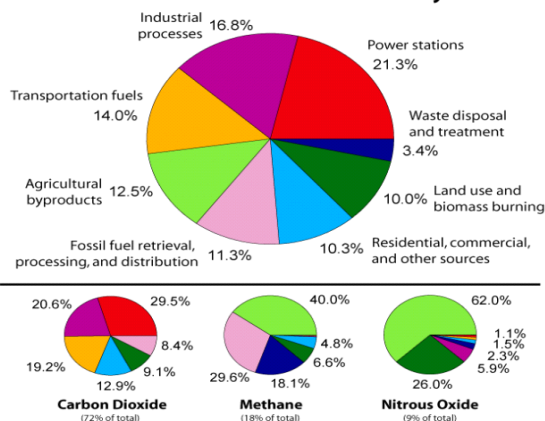
4. Area of study: - Impact of global warming on earth surface, ocean glacier and specially

Rainfall in Chhattisgarh Region.

CO₂-Main Cause of Global Warming : *The Intergovernmental panel on climate change (IPCC) periodically makes an assessment of atmospheric abundance of green house gases and its possible impact on climate.*

CO₂-(Carbon dioxide) – CO₂ is the most abundance of green house gas in the atmosphere. The level of CO₂ in the atmosphere has increased from the pre-industrial level of 280ppm to about 368ppm in 2000. This has been largely the result of fossils fuel burning, Deforestation and change in land use. Worldwide CO₂ emission from fossils fuels was **21.39 billion metric tons in 1990** (the bench mark year to measure cuts) was **22.97 billions metric tons in 1997**. When **Kyoto** meeting happened **26.40b.m.tons in 2000-2005** and reached **28.19in 2005** when the **Kyoto proposal as finally ratified (EIA 2007; IPCC2007; a: 3)** the big sources of these emissions are **industrial process 16.8%. Power station 21.3%, transportation fuels 14% are main source of green house gases (CHGs)** which caused global warming.

Annual Greenhouse Gas Emissions by Sector



Effect of Global Warming :- The effects of global warming discuss under two categories-1- Major effect 2- **General effect**. There are two **major effect** of global warming. 1- Increase of temperature of earth by about **3°C to 5°C** by the year 2100. 2- Rise of sea level by at least **25meters (82 feet's)** by the year 2100. *Some of the general effects are as follow.*

Ø *Effect on range Of Species Distribution.*

Ø *Food production.*

Ø *Ocean acidification*

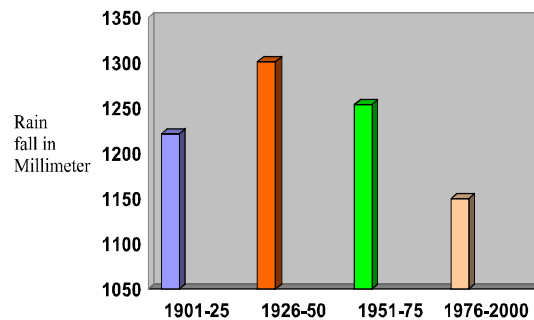
Ø *Coral bleaching-* due to global warming there is increase in temperature of ocean water the coral changes its colour from **brown to white** this phenomena is known as coral bleaching. The global temperature has increased by approximately **0.6C in the 20th century** the average temperature of earth may increase by **1.4 to 5.8C** by the year 2100 from the level 1990. Sea level is rising due to **thermal expansion** of the ocean in addition to melting of glacier and land ice. Sea level has been raised by **1 to 2 mm. per.** Year during the 20th century. In the worlds according to report of **WHO(World health organization)** *extra 150000 peoples are dying each year due to global warming it has caused floods in Yugoslavia, Serbia, Romania, and Bulgaria ,DROUGHTS in Sahel in AFRICA ,hurricane Katrina in U.S.*

Alnino Effect on Monsoon :-AL NINO is a climatic phenomenon according to director of weather department of India it is stated that when we see in past history it is clearly indicate that year *2009 is also AL NINO year like 2004.* When the water of middle Pacific Ocean evaporates on heating then it warms the upper surface of environment, it contains huge quantity of dry air and it absorbs the moisture of rainwater of monsoon. Resultantly monsoon becomes weaker due to AL NINO. The rain does not properly fall have compared to previous years.

Effect of Global Warming on Monsoon of Chhattisgarh Region :-Due to global warming the temperature of earth surface is going up and consequently the rain fall is reducing gradually .During the **last 5 decades the average rain fall in Chhattisgarh region has fallen down to 15 cm.** The change in climate due to global warming has brought the weather scientist into astonishment. The ups and downs of the climate has resulted delay in the monsoon. In *Chhattisgarh the arrival of monsoon every year has been second week of June. Where as monsoon arrived this year on 22nd June 2009. And the rain started after a fortnight in the state. Irregular monsoon, less water, rising sea level, will impact badly on Indian agriculture and as it is, major crop yields will be affected by higher temperatures.*

Rain fall change table (Table No.1)

In 50 years [1950-2000] rain fall decreases from 1301m.m.to 1150m.m. ie.151mm.OR 15.1cm.



Due to delay in monsoon it has been observed the **quantity of rainfall is also decreasing the report of the director weather centre Raipur the quantity of the rain has been decreased to 151 mm. during the past 5 decades in Chhattisgarh region**

DISTRICT WISE RAIN FALL– TABLE NO:-2

S.NO.	Name Of District	From 1st June To 09-08 2009	Annual Rainfall
01	Bilaspur	424.0 mm.	1085.0 mm.
02	Baster	602.9 mm	1415.7 mm
03	Bijapur	586.8 mm	1517.0 mm
04	Dantewara	443.8 mm	1473.3 mm
05	Durg	462.8 mm	1057.9 mm
06	Dhantari	555.8 mm	1372.5 mm
07	Jaspur	513.0 mm	1726.6 mm
08	Janjgir	589.8 mm	1212.0 mm
09	Koria	331.4 mm	1410.9 mm
10	Korba	497.6 mm	1506.7 mm
11	Kabirdham	340.3 mm	850.7 mm
12	Kanker	590.7 mm	1524.7 mm
13	Mahasamund	865.8 mm	1434.2 mm
14	Narayanpur	528.0 mm	1408.9 mm
15	Raipur	609.6 mm	1378.9 mm
16	Raigarh	603.9 mm	1279.6 mm
17	Rajnandgaon	458.0 mm	1274.0 mm
18	Sarguja	388.1 mm	1393.0 mm
Average		521.5 millimeter.	1351.2 millimeter

Findings & Results : The effect of global warming on environment has been seen by various scientists increase in temperature, ice melting, rising of sea level occurs in various parts of the world. we have taken in our studies 18 districts of Chhattisgarh region for knowing the effect of global warming on monsoon some of the findings based on data's are as below:- **1.** As shown in table 1 the base year 1901 the first initial observation had been recorded average rainfall up to **1222 millimeter (m.m.)** in 25year i.e. 1901-1925 years. **2.** In the year 1926-1950 period a good sign had been seen due to increase in average rainfall is up to 77mm i.e. 1301m.m. **3.** As shown in table no.1 during the period of 1926-1950 the average rainfall had come down up to 1254 millimeter (m.m.) **(-47 millimeter)** .it was not a good indication for environment and as it happened due to global warming. **4.** During the total rainfall had been recorded as **1301 m.m.** and in the same way during the span of **1976 to 2000** the total rainfall had been recorded further 1150 millimeter (m.m.) about **151millimeter rainfall decrease during the 5 decades** all its due to global warming in Chhattisgarh region. **5.** According to scientist the fluctuation in quantity of average rainfall and delay in monsoon has been caused by global warming. **6.** The earth temperature has been increasing year after year and consequently drastic change like **occurrence of tsunami, heavy rainfall in Mumbai(94 cm in 24hrs)&severe droughts happening, miserable floods& furious earthquake** etc. have taken place its as all due to global warming. **7.** As shown in table 2 according to record of revenue & disaster management department of Chhattisgarh government the average rainfall is **521.5 millimeter** till date **09-08-09** in comparison to last year **1351.2 millimeter average rainfall** is noted. **8.**

In *Korea& Sarguja* district average rainfall have been below **400 millimeter till 09-08-09** which has caused the crop production capacity. **9.** As shown in the table 2 in *Mahasamund* district maximum average rainfall noted to **865.8 millimeter (m.m.) on dated 09-08-09.** **10.** Due to late arrival of monsoon in Chhattisgarh region the quantity of average rainfall is lower than the expectation till date.

Approaches to Deal with Globalwarming :-

1- Reducing the green house gases emission by limiting the use of fossils fuel and by developing alternative renewable sources of energy (e.g. wind energy, solar energy etc.) **2-** Increase the vegetation covers particularly the forest for *Photosynthetic Utilization* of CO_2 . **3-** Minimizing the use of nitrogen fertilizers in agricultural for reducing N_2O emission. **4-** Developing substitute for *CHLOROFLUOROCARBON*. (*CFCS*)

Conclusion :-The global warming has affected all over the world in the field of climate change, environmental imbalance, ozone layer depletion, droughts, floods, tsunami, and other disasters. Global warming has caused by excess CO_2 emission *CHLOROFLUOROCARBON* (*CFCS*) and other harm full gases. And in Chhattisgarh region the condition of rain fall has been suffering by dint of Global warming on the basis of available data's in *last five decades*. The quantity of rainfall in Chhattisgarh has gone down to 151 millimeter .this shows the obvious impact of global warming on MONSOON. The effect of global warming can be minimizing by stopping of emission of CO_2 , *METHANE* (CH_4), *CFC* gases and by AFORESTATION.

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