The Researches on Global Warming

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Abstract: With the development of industry, the burning of fossil fuels and a lot of deforestation, the concentrations of the Earth's atmospheric carbon dioxide and other greenhouse gas are increasing. Due to the greenhouse effect of these gases, in the last 100 years, the global average surface temperature has increased. With the increase of temperature, great changes will take place, and thus lead to a lot of harm. People have work together to find some way to protect the Earth.
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1. Introduction:

Performance and Hazards of Global Warming

1.1 The direct impact of rising temperature is the melting of glaciers in the Polar Regions and the decrease of snow area.

1.1.1 Almost all the world's glaciers are melting, many of which melt much faster. Such as the International Committee of snow and ice research report (ICSI) states: "Himalayan glaciers receding faster than any other area in the world. With this speed now, it is likely that these glaciers will disappear . "The Glacier National Park, Montana Boulder Glacier is a 1930s American popular tourist attractions, has little ice and snow now. What's worse, The thin Arctic ice and the tundra which is in the north of the Arctic and surround Arctic Ocean are melting faster. So the rising speed of temperatures in the Arctic is faster than anywhere in the world.

1.1.2 Snow and ice melting water is the main source of fresh water for the survival of the people. However, the tip of the ice circulation system is damaged. The accumulation rate is far from faster than the rate of the ice melt. And even some icebergs are no longer accumulated, which cuts off the local drinking water. Conflicts and wars resulting from lack of water will increase.

1.1.3It is even more frightening that scientists have found that Arctic warming will cause the presence of glaciers and ice-cold waters began to release toxic chemicals. These substances include pesticides DDT, lindane, chlordane and industrial chemicals PCBs, fungicide hexachlorobenzene, etc. All are persistent organic pollutants. It may cause cancer and deformities, which are difficult to break down.

1.1.4 In recent years, the researchers found weird flu virus, the poliomyelitis virus, smallpox virus and viral species has not yet been proven in freezing ice. Recently, US scientists have discovered some virus strains which hide in glaciers may lead to the spread of disease. Once the glaciers are melting, these viruses may take the opportunity to sojourn in the host body through melt water, the host can be human, animals, aquatic organisms and so on.

When the virus found the host, with one host pass to another, the disease is likely to break out and become popular. Bowling Green State University, Ohio, Scott - view with Professor Rogers said: "My feeling is that such a large-scale epidemic may happen many times in the past, which can be the reason of the mass extinction of some species that once existed on Earth. And this epidemic would still occur many times in the future. "

1.2 Global warming will lead to sea level rising.

1.2.1 In the past 100 years, global sea level rises 1~2cm every year on average. It is expected that by 2050 the sea level will continue to rise by 30 ~50 cm, seawater will flood the land. Around the world, nearly 70% of the coastal zone, especially the majority of low-lying delta plain will become a flood plain. Many of the world famous cities, such as New York, London, Amsterdam, Venice, Sydney, Tokyo, Rio, Tianjin, Shanghai, Guangzhou, etc., will be submerged thereon.

1.2.2The second bad consequence of sea level rising is seawater intrusion, causing the water table to rise, which lead to the deterioration of water quality in coastal areas. The ecological environment and resources are also destroyed. When Sea-level rises seawater will intrusion into inland together with rivers. Then water in estuaries and groundwater will become salty, influencing the qualities of drinking water and industrial water and increasing the pressure on water resources in the region. It also lead to the lost of coastal wetlands, mangroves, coral reefs and other ecological groups and cause the coast, estuaries, bays natural environment imbalance, which do harm to the environment of coast.

1.3Abnormal weather phenomena

1.3.1 Global temperatures rising will lead to uneven rainfall. The precipitation in some areas may increase, while others may decrease. Especially the precipitation in high latitudes will increase,and precipitation decreased in areas such as Africa. For instance, the Sahel region of West Africa suffers from severe drought from 1965.The rainfall in North China is reducing every year,. Compared with the 1950s, precipitation in North China has been reduced by 1/3, water resource reduces by 1 / 2.Every year, stricken area due to the drought is about 4 million acres in China. The National Irrigation lacks 30 billion cubic meters of water per year.

1.3.2 At the same time, the frequency of occurrence of extreme weather continues to increase, The heat brought about by temperatures rising, provide great momentum for air and ocean to form a large, or even super typhoons, hurricanes, tsunamis and other disasters. A variety of meteorological disasters such as droughts, storm, flood, heat, cold and even rain, typhoons, hail, dust storms, snow, frost, fog and other weather events and anomalies are associated with climate warming.

1.4 new ice age

Global warming makes another surprising result. Due to the melting of the Arctic ice field, rainfall increases, as well as the changing type of wind. A lot of fresh water inflow into North Atlantic, then the Gulf Stream will be damaged, temperatures in northwest Europe may drop 5 ~ 8℃, Europe may face a new ice age.

1.5 Higher temperatures lead to dramatic results of global climate change which affect the normal life of organisms, then lead to the loss of biodiversity.

1.5.1 First, global warming causes terrestrial climate zone migration to occur. The lagging biological migration can easily cause the population size of the species and the ecosystem species composition changing greatly, leading to the extinction of part of the species and even the degradation and disappear of ecosystems. The climate fluctuations cycle in Geological history is longer than the temperature cycle that we experience now. So the creatures have enough time to adapt to the change. And short-term temperature increase can make poor adaptability of species extinct. Meanwhile, the sea surface temperature rise caused by global warming has caused the loss of biodiversity.

1.5.2 Secondly, rising sea levels caused by global warming lead to low-lying coastal land being flooded, forcing the creatures to find new migration habitats. Extinction is very likely to occur. In addition, saltwater intrusion phenomenon caused by rising sea levels also makes habitat change, leading to the extinction of species. The phenomenon of migration habitat loss is the most direct cause of biodiversity.

1.5.3 Finally, due to global warming, drought trend is being evident in some areas, associated with irrational human exploitation. Due to the lack of moisture and the decline of soil fertility, the production of plant is reduced and the number of animals that can be supported reduce seriously, Many individuals died due to hunger, extinction of individual species in fragile ecosystems also easily lead chain of extinction events.

1.6 Global warming also bring bad effects to humans.

1.6.1First, the heat affected. High temperatures can damage the human immune system and disease resistance ability, resulting in heat-related morbidity and heart, respiratory system diseases and mortality increasing. This impact on the elderly, children, the poor populations in developing countries is particularly significant. World Health Organization predicts that by 2020 people worldwide die from the heat will increase by 1 time.

1.6.2Second, the changes in air quality: The weather may also cause abnormal decline in air quality in some areas, the El Niño - Southern Oscillation (ENSO) events become more frequently, longer lasting and more intense (IPCC Working Group I Third Assessment Report Climate 2001) urban heat island is more obvious, According to statistics, the largest heat island intensity was observed in 1997 (temperature difference between urban and rural areas). Beijing was 9 ℃ (higher than Shanghai 6.8 ℃, 11 ℃ after Vancouver, Canada, Germany, Berlin 13.3 ℃). Thereby endanger human health. Some extreme weather anomalies even affect human mental health, resulting in increased morbidity spirit, the accident and crime rates is also rising.

1.6.3Third, the spread of the disease: in fact, the tropic is a district with high incidence of infectious and parasitic diseases and is the largest viral diseases birthplace. Warming will cause temperate areas of infection or disease-causing pathogens carrying insects and rodents distribution area expanded, extending the harm likelihood of disease and increasing the possibility of the spread of these diseases. At the same time, global warming contribute to insects' breeding and enhance their body's pathogen virulence, increasing pathogenicity, increased mainly through mosquito-borne diseases' outbreak frequency and intensity, such as malaria, schistosomiasis and dengue fever.

Conclusion

The impact of global warming involves many aspects, such as melting of glaciers, sea level rising, abnormal weather phenomena, and so on. so we must take actions to solve it.

2. The Causes of Global Warming

Since the early 20th century, the global air and sea surface temperature has increased about 0.8°C (1.4°F), with about two-thirds of the increase occurring since 1980. Each of the last three decades has been successively warmer at the Earth's surface than any preceding decade since 1850.

First of all, we should know the principle of the atmosphere about how to keep the ground temperature.

The system of Global atmosphere and land surface is like a huge "glass house", so that the surface has always maintained a certain temperature, resulting in humans and other organisms suitable living environment. In this system, the atmosphere allows solar radiation through and reaches the ground, and to trap heat within the surface-troposphere system. We put the effect of the atmosphere called greenhouse effect. And the gases which cause this effect called "greenhouse gases". Water vapor (H_2O),carbon dioxide (CO_2), nitrous oxide (N_2O),methane (CH_4) and ozone (O_3) are the primary greenhouse gases in the Earth's atmosphere.("IPCC AR4 SYR Appendix Glossary" (PDF). Retrieved 14 December 2008.)

Carbon dioxide and other greenhouse gases have high permeability to visible radiation from the sun, while they have highly absorbent to long-wave radiation emitted by the Earth and can strongly absorb infrared radiation the ground, causing the Earth's temperature to rise, namely the greenhouse effect. With the accumulation of greenhouse gases, it causes the system to gas absorption and emission of energy imbalance. The energy in the earth-atmosphere system continuously accumulate, causing the temperature to rise and causing global warming phenomenon.

And there are many causes for global warming in the world today.

2.1. **Anthropogenic causes**

2.1.1 Rapid population growth

Rapid population growth is not only a social problem, but also one of the main environmental problems. The number of population is so large, causing that only a year of carbon dioxide emissions can be a staggering figure.

2.1.2 Environmental destruction

Environmental pollution has been a major global problem. And it is also one of the causes of global warming. The leading cause of global warming is the ongoing burning of fossil fuels, which release carbon dioxide and other green house gases into the atmosphere .Fossil fuel burning has produced about three-quarters of the increase in CO_2 from human activity over the past 20 years. The rest of this increase is caused mostly by changes in land-use, particularly deforestation. (IPCC, Summary for Policymakers, Concentrations of atmospheric greenhouse gases ..., p.7, in IPCC TAR WG1 2001) Estimates of global CO_2 emissions in 2011 from fossil fuel combustion, including cement production and gas flaring, was 34.8 billion tones (9.5 ± 0.5 PgC), an increase of 54% above emissions in 1990. Coal burning was responsible for 43% of the total emissions, oil 34%, gas 18%, cement 4.9% and gas flaring 0.7%

And there are some charts to show some information about it.

Table 1.The Country's Carbon Dioxide Emissions (2008) Top 10

Rank	Country or region	Annual carbon dioxide emissions (kt)	Percentage of total global
	World	29,888,121	100%
1	(Excluding Hong Kong and Macao) China	7,031,916	23.33%
2	USA	5,461,014	18.11%
-	EU (27)	4,177,817	14.04%
3	India	1,742,698	5.78%
4	Russia	1,708,653	5.67%
5	Japan	1,208,163	4.01%
6	Germany	786,660	2.61%
7	Canada	544,091	1.80%
8	Iran	538,404	1.79%
9	United Kingdom	522,856	1.73%
10	Korea	509,170	1.69%

Table 2. The country's carbon dioxide emissions (2009) Top 10

Country or region	CDIAC published values	IEA estimated value according to sectoral approach	IEA estimated value by reference method
World	31,629,955	28,999,354	29,549,299
China	7,463,289	6,831,596	7,037,864
USA	5,273,760	5,195,018	5,290,006
EU (27)	N/A	3,576,786	3,623,402
India	1,891,422	1,585,817	1,629,959
Russia	1,596,213	1,532,599	1,528,568
Japan	1,066,233	1,092,859	1,092,878
Germany	733,550	750,188	755,140
Iran	558,923	533,223	549,077
Korea	515 749	515,465	518,149
Canada	507,260	520,746	501,293

Table 3. The country's carbon dioxide emissions (2010) Top 10

Country or region	carbon dioxide emissions	Area (km^2)	Population	emissions /km^2	emissions / person
World	33,508,901	148,940,000	6,852,472,823	2,250	49
China	8,240,958	9,640,821	1,339,724,852	8,548	62
USA	5,492,170	9,826,675	312,793,000	5,589	176
India	2,069,738	3,287,263	1,210,193,422	6,296	17
Russia	1,688,688	17,075,400	142,946,800	989	118
Japan	1,138,432	377,944	128,056,026	30,122	89
Germany	762,543	357,021	81,799,600	21,358	93
Iran	574,667	1,648,195	75,330,000	3,487	76
Korea	563,126	100,210	48,875,000	56,195	115
Canada	518,475	9,984,670	34,685,000	519	149
Saudi Arabia	493,726	2,149,690	27,136,977	2,297	182

What's more, trees absorb carbon dioxide in air to produce oxygen and sugars. When forests are destroyed, the timber will be used as fuel for heating or fired into carbon. In the process of using it can produce carbon dioxide, increasing the content of carbon dioxide in the atmosphere, further exacerbating the greenhouse effect and accelerate global warming.

2.2. **Natural causes**

2.2.1 The rising temperature of the oceans

Carbon dioxide can be absorbed by seawater. If the water is cold, it can hold more gas. Unfortunately, with global warming, the temperature of the oceans has been increasing. As the temperature increase, more carbon dioxide is released. This vicious circle will continue to occur unless scientist can prevent this from occurring. (An Integrated Academic English Course, Unit1, Reading 2).

2.2.2 Solar activity

Earth's atmospheric science expert Richard

Lindzen from MIT thought that carbon dioxide emissions are not the main reason for global warming .He was in the year 2007 Newsweek magazine wrote that the global temperatures are rising fastest in 1910 ~ 1940, then ushered in 30 years of global cooling phase, until 1978 global temperatures began to rise again. If industrial carbon dioxide emissions are the main cause of global warming, then how to explain the cooling phase from 1940 to 1978. As we all know, the most countries of the world began the era of the Great Leap Forward in the three decades. March 8, 2007 the BBC broadcast a documentary "The Great Global Warming Swindle" and offered a completely different attitude to the current mainstream view, discussing issues of global warming. The film put forward the "warming phenomenon is not caused by human activity", and accessing more than climatologists, finally concluded that the solar activity was probably the main cause of global warming, human influence on climate is negligible.

3. Materials and Methods to stop global warming

3.1 Some aspects in stopping global warming. Global warming is an indisputable fact that, especially in the last 50 years, and warming is accelerating. Hot South throughout this year are a reflection of warming. According to recent observations show that the 1906-2005 global average surface temperature has risen by 0.74 degrees Celsius, average temperatures in the northern hemisphere in the late 20th century is the tallest of the past 1300 years. United States space agency NASA's Goddard Institute for space studies published last month said that 2008 was the Ninth hottest years since 1850 on record. It is estimated that the next El Nino this year or next year began to take shape. The global surface temperature is likely to set a new record in the next year or two. So, do we sit around watching global warming gradually intensifying it? no, now finishing presents the main measures to cope with global warming, let us learn together, protect the Earth.

3.1.1. Ban CFCs

Actual global efforts in this direction, is a possibility in the case to achieve. If the case can be achieved, for global warming by 2050, according to estimates the inhibiting effect of 3% to play around.

3.1.2. Global forest protection

Forest with tropical rain forest today for a living, are being artificially sustained dramatic damage. Effective counter-measures, is include stopping the rampant forest destruction, implement large-scale afforestation and on the other hand, efforts to promote forest regeneration. At present due to deforestation and carbon dioxide is released into the atmosphere, according to estimated at 1~2GT about carbon. If countries are serious about promoting moderation logging and forest regeneration plan, by the year 2050, may cause the entire biosphere absorb 0.7GT each year. The amount of carbon dioxide is about 7% results to reduce greenhouse is effective.

3.1.3 To improve auto fuel used

Japan car in this regard has been the technological upgrading, substantial improvement in petrol consumption of the past. But in the United States and other places, perhaps due to oil-rich, for fuel-saving designs, has not seen any significant signs of improvement. It still maintains a situation of excessive fuel consumption. Therefore, the vehicles produced in the region in terms of improving fuel design, with sufficient room for play. Due to cut fossil fuel consumption as a result of this effort, it is estimated that by the year 2050, can reduce greenhouse 5%.

3.1.4. Motorcycle exhaust restriction

Due to car exhaust, contains large amounts of nitrogen oxides and carbon monoxide, and people want to reduce its emissions. The purpose of this practice could not be reached directly with a reduction of carbon dioxide, but capable of inhibiting the effects of ozone, methane and other greenhouse gases. Expected by 2050 the world will be warm, and sharing about 2% of the inhibitory effect.

3.2 Different countries have different measures. For is "fever" of Earth, far has scientists were research all "blame enrollment" of feasibility. Near look, States Government have launched various measures to complete with "fever" of Earth racing, trying to slowed global variable warm of intensified。

3.2.1 United States and China

United States and China are the world's two largest emitters of greenhouse gases. To reduce greenhouse gas emissions, the two countries have made insufficient efforts. United Nations on solving environmental problems caught up in the endless discussion in the framework of the integrated program. And scientific groups are constantly urged to take immediate action. A scholar at the Woodrow Wilson International Center studying climate change public policy scholar Lusi linsipan Beier says, "The Intergovernmental Panel on climate change has played an important role in reporting the truth but I'm still amazed that they are like a magic bullet, let each country act. This report for the purpose of preparing additional international consultations. For 9 consecutive years, they held 17 meetings of senior international. In September, the Government, businesses, heads of industry and advocacy groups invited by the United Nations Secretary-General Ban Ki-moon met in New York to discuss climate change.

In 2015, the Paris for the 21st session of the United Nations climate change conference will be

convened, Government will meet again from 195 countries to agree climate change targets. Past consultations under the framework of the United Nations climate change effect is not always obvious. In 2009, the Copenhagen climate change conference hopes to further reduce greenhouse gas emissions and to establish a Joint Convention and ensure that global temperatures do not rise more than 1.5 degrees Celsius. However, the proposed non-party wants the country to focus on reduction targets of the Joint Convention. Hagen-week meeting was chaired by both countries, China is now the world's two largest emitters of greenhouse gases. Meeting resulted in poor countries bear the brunt of climate change and attempts to lead some of the European countries were not satisfied. But the United States, there is some news is encouraging. United States Secretary of State John Kerry says the Intergovernmental Panel on climate change will have on the world as a warning. The Obama administration wants to use the Intergovernmental Panel on climate change warned get support on greenhouse gas emissions reduction plan. Because the United States is one of the world's rare several governments oppose changing country about climate change. Take this opportunity; the White House proposed climate-change related decrees, put pressure on Congress.

3.2.2 Thailand capital Bangkok

In this year global climate changes Conference closing Hou of fifth days at 7 o'clock in the evening, hosts city, and Thailand capital Bangkok lights 15 minutes, to response global energy movement, improve public for reduced Earth greenhouse effect output of consciousness. Bangkok Mayor, Abila, said, coming 9th of each month as the city's lights out 15 minutes of "Bangkok energy conservation day", with moments of the city that never sleeps "grim", calls for the planet's future is "bright". It is estimated that this activity can reduce 4800 tons of greenhouse gas emissions.

3.2.3 Finland

Finland Government uses this income to support the development of energy technologies. Long winter make Finland the heating energy consumption considerably. To this end, in addition to optimize the structural design, the Finland attaches great importance to the thermal insulation of buildings to minimize Interior heat loss. Finland Ministry of the environment has developed a new standard of insulation in buildings, new buildings must have insulation on the wall, indoor ventilation. Increasing the thickness of the wall, using a two-tier or three-tier Windows automatic regulating valves of heating equipment installed in each room. These measures can reduce the energy consumption of buildings 10%-15%. Finland is in the use of renewable energy, in particular biofuels, to lead the world. Currently, Finland renewable energy consumption accounted for Finland's energy consumption as a whole one-fourth. This includes: using biological sludge generated in the production of pulp and paper industry and wood waste as fuel, hydraulic and wind power, and solar energy.

3.2.4 United Kingdom

United Kingdom, a levy on all commercial unit of electricity, is the only "climate tax" countries. Tax is very complicated. In addition, if the signed agreements with the Government and enterprises in achieving the emission reduction targets within the stipulated time, climate change, taxes can be reduced 80%. Today, the United Kingdom approximately 1200 businesses and Governments signed the agreement on emissions reductions, most achieving the emission reduction targets. United Kingdom Government has also set up a carbon funds specifically for small and medium enterprises, 50 million pounds a year, a project can apply for up to 100,000 pounds, to consult energy-saving technologies and buying energy-efficient equipment. More attractive to business is a mature United Kingdom emission trading system, the industry known as "carbon credits", that is, emissions reductions can be sold on the open market. This system fully embodies the principle of "whose environmental benefits" principle. And the Government signed the deal but did not finish cuts in emissions, or buy emission reductions than they think to market cheaper companies to cut emissions, primarily buyers. And those who exceed emissions or achieve emissions reductions at a lower cost business is profitable.

3.2.5 Germany

Germany is automobile-producing country, but the Government for vehicle emission control of very stringent. At present, the Germany Government was still discussing whether to limit the vehicle speed to further regulate automobile tailpipe emissions. Germany climate experts also urged the public to avoid the long flight, in order to reduce carbon dioxide emissions. In terms of energy saving, Germany with "EU leaders" itself, Germany Government is planning to call for mass adoption of EU-wide energy saving lamp. Germany also called for the adoption of legal instruments requiring EU countries to use renewable energy, setting such as solar energy, wind energy as a proportion of total energy consumption.

3.2.6 Japan

In Japan, the Government promised greenhouse gases such as carbon dioxide emissions from 2008 to 2012 will be 6% less than in 1990. Japan imposed the "leader" system in more than 6 years. Leader, namely, is the motor vehicles, electrical appliances and other products manufacturing industries with the lowest energy consumption model. Government determined

the highest available energy-saving standards for home appliances, cars, so that fuel consumption standards for cars, appliances and other energy-efficiency standards above the current commercialization of mechanical and electrical products in the best product performance. People who break the standard will be warned, noticed, ordered or fined (1 million yen).

4. Results.

Countries take effective measures to actively suppress the climate warming, is conducive to the development of society. Developed and developing countries, although in the economic development there are still problems and conflicts, but the two sides in the fact of global warming or reached a consensus, through all the hard all the time, global warming to effectively curb.

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