

“Climate Change Crisis”-The Global Warming

Ms. Suchilipsa Das
Assistant professor in Chemistry
Modern Institute Of Technology and Management
Bhubaneswar
Orissa
India

ABSTRACT

Climate change is one of the greatest problem facing the planet. Recent years show increasing temperatures in various regions, and/or increasing extremities in weather patterns. Almost 100% of the observed temperature increase over the last 50 years has been due to the increase in the atmosphere of greenhouse gas concentrations like water vapour, carbon dioxide (CO₂), methane(CH₄),Nitrous Oxide(N₂O) ChloroFluoroCarbons(CFCs) etc.Greenhouse gases are those gases that contribute to the greenhouse effect. This greenhouse effect causes **Global warming** already disrupts millions of lives daily in the forms of destructive weather patterns and loss of habitat. This paper outlines cause, effect of global warming on climate change and so on the ecology and economy. Some ways that we can act to prevent the global warming. While humankind has the ability to change the climate, we must also help to prevent,protect and sustain it.

INTRODUCTION:

This section looks at global warming which causes climate change, what are the impacts and how these can be prevented. Global warming refers to the rising average temperature of Earth's atmosphere and oceans, which started to increase in the late 19th century and is projected to keep going up. Since the early 20th century, Earth's average surface temperature has increased by about 0.8 °C (1.4 °F), with about two thirds of the increase occurring since 1980. Warming of the climate system is unequivocal, and it is certain that most of it is caused by increasing concentrations of greenhouse gases like water vapour, carbon dioxide (CO₂), methane(CH₄),Nitrous Oxide(N₂O), ChloroFluoroCarbons(CFCs) etc. Greenhouse gases are those gases that contribute to the greenhouse effect produced by human activities such as deforestation and burning of fossil fuels. These findings are recognized by the national science academies of all the major industrialized nations. It leads to many serious effects such as increase of temperature on the earth and rise of sea levels. With increase in global warming species and their habitats are lost.Ecosystem is destabilized.It also effects world economy. There are also some ways to prevent the global warming and prevent climate change.

Cause of global warming:

Greenhouse gases are those that can absorb and emit infra-red radiation^[1]but not radiation in or near the visible spectrum. In order, the most abundant greenhouse gases in Earth's atmosphere are:

- Water vapour(H_2O)
- Carbon dioxide(CO_2)
- methane (CH_4)
- nitrous oxide(N_2O)
- Ozone(O_3)

Different greenhouse gases have very different heat-trapping abilities. Some of them can even trap more heat than CO_2 which leads to green house effect. A molecule of methane produces more than 20 times the warming of a molecule of CO_2 . Nitrous oxide is 300 times more powerful than CO_2 . Other gases, such as chlorofluorocarbons (which have been banned in much of the world because they also degrade the ozone layer), have heat-trapping potential thousands of times greater than CO_2 . But because their concentrations are much lower than CO_2 , none of these gases adds as much warmth to the atmosphere as CO_2 does.

The main sources of greenhouse gases due to human activity are:

- burning of fossil fuel and deforestation leading to higher carbon dioxide concentrations in the air. Land use change (mainly deforestation in the tropics) account for up to one third of total anthropogenic CO_2 emissions.^[2]
- livestock enteric fermentation and manure management,^[3] paddy rice farming, land use and wetland changes, pipeline losses, and covered vented landfill emissions leading to higher methane atmospheric concentrations. Many of the newer style fully vented septic systems that enhance and target the fermentation process also are sources of atmospheric methane
- use of chlorofluorocarbons (CFCs) in refrigeration systems and use of CFCs and halons in fire suppression systems and manufacturing processes.
- agricultural activities, including the use of fertilizers, that lead to higher nitrous oxide. The high rate of application of nitrogen-rich fertilizers has effects on the heat storage of cropland (nitrogen oxides have 300 times more heat-trapping capacity per unit of volume than carbon dioxide)

Effect of global warming: On climate change

Rise in sea levels worldwide

Scientists predict an increase in sea levels worldwide due to the melting of two massive ice sheets in Antarctica and Greenland, especially on the East coast of the U.S. However, many nations around the world will experience the effects of rising sea levels, which could displace millions of people. There will be rise of sea levels by at least 25 meters (82 feet) by the year 2100.

Increase of temperature

There will be increase of temperature on the earth by about 3° to 5° C (5.4° to 9° Fahrenheit) by the year 2100.

More killer disasters

The severity of storms such as hurricanes and cyclones is increasing, and research published in *Nature* found.

Cyclone

Scientists have come up with the firmest evidence so far that global warming will significantly increase the intensity of the most extreme storms worldwide. The maximum wind speeds of the strongest tropical cyclones have increased significantly since 1981, according to research published in *Nature* this week. And the upward trend, thought to be driven by rising ocean temperatures, is unlikely to stop at any time soon.

More Hurricanes

Over the past century, the number of hurricanes that strike each year has more than doubled. Scientists blame global warming and the rising temperature of the surface of the seas.

More Floods

During the summer of 2007, Britain suffered its worst flood in 60 years. Scientists point the finger directly at global warming, which changed precipitation patterns and is now causing more intense rainstorms across parts of the northern hemisphere.

Greenland's

Melting

Greenland is melting at a rate of 52 cubic miles per year much faster than once predicted. If Greenland's entire 2.5 million cubic kilometers of ice were to melt, it would lead to a global sea level rise of 7.2 meters, or more than 23 feet.

Less Ice in the Arctic

The amount of ice in the Arctic at the end of the 2005 summer was the smallest seen in 27 years of satellite imaging, and probably the smallest in 100 years. Experts said it's the strongest evidence of global warming in the Arctic thus far.

The Green Grass of Antarctica

Grass has started to grow in Antarctica in areas formerly covered by ice sheets and glaciers. While Antarctic hair grass has grown before in isolated tufts, warmer temperatures allow it to take over larger and larger areas and, for the first time, survive through the winter.

Giant Sand Seas in Africa

Global warming may unleash giant "sand seas" in Africa—giant fields of sand dunes with no vegetation as a shortage of rainfall and increasing winds may reactivate the now-stable Kalahari dune fields. That means farewell to local vegetation, animals, and any tourism in the areas.

The Oceans are Turning to Acid

The oceans are turning to acid. Oceans absorb CO₂ which, when mixed with seawater, turns to a weak carbonic acid. Calcium from eroded rocks creates a "natural buffer" against the acid, and

most marine life is “finely tuned” to the current balance. As we produce more and more CO₂, we throw the whole balance out of control and the oceans turn to acid.

Global Warming Effect: On economy

According to recent research, there is a 90% chance that 3 billion people worldwide will have to choose between moving their families to milder climates and going hungry due to climate change within 100 years. Higher growing season temperatures can significantly impact agricultural productivity, farm incomes and food security.

Climate change is expected to have the most severe impact on water supplies. Shortages in future are likely to threaten food production, hinder economic development. Globally, the areas sown for the major crops of barley, maize, rice, sorghum, soya bean and wheat have all seen an increase in the percentage of area affected by drought.

Food production can also be impacted by too much water. Heavy rainfall events leading to flooding can wipe out entire crops over wide areas, and excess water can also lead to other impacts including soil water logging, anaerobicity and reduced plant growth. Indirect impacts include delayed farming operations.

Developing countries, many with average temperatures that are already near or above crop tolerance levels, are predicted to suffer an average 10 to 25 percent decline in agricultural productivity by the 2080s. A study by IISS found that reduced water supplies and hotter temperatures mean 65 countries were likely to lose over 15 percent of their agricultural output by 2100. The Intergovernmental Panel on Climate Change (IPCC) has produced several reports that have assessed the scientific literature on climate change. The IPCC Third Assessment Report, published in 2001, concluded that the poorest countries would be hardest hit, with reductions in crop yields in most tropical and sub-tropical regions due to decreased water availability, and new or changed insect pest incidence. (In Africa and Latin America many rain fed crops are near their maximum temperature tolerance, so that yields are likely to fall sharply for even small climate changes; falls in agricultural productivity of up to 30% over the 21st century are projected. Marine life and the fishing industry will also be severely affected in some places.)

Regional projections for agriculture^[5]:

Africa

In Africa, IPCC (2007:13)^[6] projected that climate variability and change would severely compromise agricultural production and access to food. This projection was assigned "high confidence."

Asia

In East and Southeast Asia, IPCC (2007:13)^[6] projected that crop yields could increase up to 20% by the mid-21st century. In Central and South Asia, projections suggested that yields might decrease by up to 30%, over the same time period. These projections were assigned "medium confidence." Taken together, the risk of hunger was projected to remain very high in several developing countries.

Australia and New Zealand

Hennessy *et al.* (2007:509)^[7] assessed the literature for Australia and New Zealand. They concluded that without further adaptation to climate change, projected impacts would likely be substantial: By 2030, production from agriculture and forestry was projected to decline over much of southern and eastern Australia, and over parts of eastern New Zealand; In New Zealand, initial benefits were projected close to major rivers and in western and southern areas. Hennessy *et al.* (2007:509)^[7] placed high confidence in these projections.

Europe

With high confidence, IPCC (2007:14)^[6] projected that in Southern Europe, climate change would reduce crop productivity. In Central and Eastern Europe, forest productivity was expected to decline. In Northern Europe, the initial effect of climate change was projected to increase crop yields.

Latin America

With high confidence, IPCC (2007:14)^[6] projected that in drier areas of Latin America, productivity of some important crops would decrease and livestock productivity decline, with adverse consequences for food security. In temperate zones, soybean yields were projected to increase.

North America

With high confidence, IPCC (2007:14–15)^[6] projected that over the first few decades of this century, moderate climate change would increase aggregate yields of rain-fed agriculture by 5–20%, but with important variability among regions. Major challenges were projected for crops that are near the warm end of their suitable range or which depend on highly utilized water resources.

United States

The US Global Change Research Program (2009) assessed the literature on the impacts of climate change on agriculture in the United States.^[8]

- Many crops will benefit from increased atmospheric CO₂ concentrations and low levels of warming, but higher levels of warming will negatively affect growth and yields. Extreme events will likely reduce crop yields.
- Weeds, diseases and insect pests benefit from warming, and will require more attention in regards to pest and weed control.
- Increasing CO₂ concentrations will reduce the land's ability to supply adequate livestock feed. Increased heat, disease, and weather extremes will likely reduce livestock productivity.

Polar regions (Arctic and Antarctic)

Anisimov *et al.* (2007:655)^[9] assessed the literature for the polar region (Arctic and Antarctica). With medium confidence, they concluded that the benefits of a less severe climate were dependent on local conditions. One of these benefits was judged to be increased agricultural and forestry opportunities. For the *Guardian* newspaper, Brown (2005)^[10] reported on how climate change had affected agriculture in Iceland. Rising temperatures had made the widespread sowing of barley possible, which had been untenable twenty years ago. Some of the warming was due to a local (possibly temporary) effect via ocean currents from the Caribbean, which had also affected fish stocks.

Small islands

In a literature assessment, Mimura *et al.* (2007:689)^[11] concluded that on small islands, subsistence and commercial agriculture would very likely be adversely affected by climate change. This projection was assigned "high confidence."

Model projections suggest that although increased temperature and decreased soil moisture will act to reduce global crop yields by 2050, the direct fertilization effect of rising carbon dioxide concentration (CO₂) will offset these losses. Rising atmospheric concentrations of CO₂: Increasing atmospheric CO₂ levels, driven by emissions from human activities, can act as a fertilizer and enhance the growth of some crops such as wheat, rice and soybeans.

Global warming has affected the world economy in the following areas apart from agricultural productivity.

Earning of revenues. As per the Kyoto Protocol on global warming, countries will have to pay for high carbon emissions and can also trade with deficient countries. While, the developed world, led by USA and Europe are among the high polluters, India, China, along with most developing countries are among the deficient countries who can earn revenues from trading in these emissions.

On fishing: The rising temperature of the water is destroying the marine life at a fast pace and it will surely harm the fishing industry of the world.

Human resource: If people get affected by poor health and suffer from various diseases, it ultimately harms their potential and that leads to waste of human resources.

Bank: The United Nations Environment Programs put emphasis on the fact that the prevalence of global warming in the world is capable of doing great harm to the insurers, re-insurers and bank.

Disease: Direct impacts from global warming on regional economies will also include a serious blow to the timber industry from increased prevalence of pests like the southern pine beetle, slower growth rates for trees, and more frequent wildfires. This would mean a decrease in revenue for producers.

Resource: For resource-dependent states and industries, whether you are calculating expected agricultural yields or changes in hydroelectric energy production from melting snow pack, global warming has real consequences for businesses and investors.

Livestock: A rise in temperature could also have a significant effect on the performance of farm animals, in addition to the effects that might flow from altered yields of grassland and forage crops. Young animals tend to be less tolerant of a wide range of temperature than adults. A rise in summer temperatures, especially in regions with a continental climate characterized today by summer temperatures near the threshold tolerated by livestock (such as the south-central USA and USSR) could be detrimental to production.

Global Warming Effect: On ecology

The interrelationship of living organisms and climatic factors are badly affected by global warming. As a result species extinction is observed and ecosystem is destabilized.

Species Disappear

The latest report from the World Conservation Union says that a minimum of 40 percent of the world's species are being threatened and global warming's one of the main culprits.

Cannibalistic Polar Bears at risk

As longer seasons without ice keep polar bears away from food, they start eating each other.

Dying Polar Bears

A recent study completed by the U.S. Geological Survey shows that cannibalism while brutal may be the least of the bear's problems. Many are also drowning, unable to swim in the increased spaces between melting sea ice. Two-thirds of them may be gone by 2050.

More Bear Attacks

Earlier this year, Moscow warned its citizens to beware of brown bear attacks. In Russia, it's been too hot in the winter for bears to sleep. When bears can't hibernate, they get very grouchy and become unusually aggressive.

Starving Gray Whales

Global warming is thwarting majestic gray whales' struggle to recover from their endangered status. In recent years, more gray whales have been washing up on beaches after starving to death.

Declining population of Penguins

Scientists blame global warming for the declining penguin population, as warmer waters and smaller ice floes force the birds to travel further to find food. Emperor penguins have dropped from 300 breeding pairs to just nine in the western Antarctic Peninsula.

Disappearance of Frogs

An estimated two-thirds of the 110 known species of harlequin frog in Central and South America have vanished since the 1980s due to the outbreak of a deadly frog fungus brought on by global warming. Scientist J. Allen Pound: Disease is the bullet killing frogs, but climate change is pulling the trigger.

Arctic Fox

The White Arctic Fox used to rule the colder climes, but as temperatures warm up, it's more aggressive cousin, the Red Fox, is moving North and taking over.

Walrus

Walrus pups rest on sea ice while their mothers hunt for food. A new study shows more and more abandoned pups are being stranded on floating islands as ice islands melt. Also sadly mother walruses are abandoning them to follow the ice further north.

Cute Koala Bears

Australia's Climate Action Network reports that higher temperatures are killing off eucalyptus trees while higher levels of CO₂ in the atmosphere are decreasing the nutritional value of the eucalyptus leaves Koala bears eat. They warn that the cute furry creatures could become extinct in the next few decades.

Jellyfish Attack

At least 30,000 people were stung by jellyfish along the Mediterranean coast last year; some areas boasted more than 10 jellyfish per square foot of water. Jellyfish generally stay out of the way of swimmers, preferring the warmer, saltier water of the open seas. Hotter temperatures erase the natural temperature barrier between the open sea and the shore. The offshore waters also become more saline, causing the stinging blobs of hurt to move in toward the coastlines.

Giant Squid Attack

Giant squid an aggressive predator that grows up to 7 feet long and can weigh more than 110 lbs used to only be found in the warm waters along the Pacific equator. Hotter waters mean today they're invading the waters of California and even Alaska.

Homeless Sheep, Goats, and Bears

Bighorn sheep, mountain goats, and grizzly bears are becoming homeless, due to the disappearance of the alpine meadows in Glacier National Park.

Homeless Deer and Marsh Rabbits

The deer and marsh rabbits in the Florida Keys also face a housing crisis, as water levels rise and warmer temperatures destroy coastal prairies and freshwater marsh habitats.

Gender-Bended Lizards

Scientists in Australia found warmer temperatures caused baby bearded dragon lizards to change from males to females while still in their eggs, making it harder for them to find mates.

Stray Kitties

Global warming has extended the cat-breeding season beyond spring, which is the usual time for a kitten boom. The kittens are often homeless and end up in animal shelters.

Suffocation of Lemmings

Lemmings like to burrow under the snow when they hibernate for the winter. Warmer

temperatures cause rain to fall during the winter months, where it freezes into a hard sheet of ice above the sleeping lemmings, who can't crack their way out come spring.

Death to Cod

Cod in the North Sea are dying out. The warmer waters kill off the plankton the cod eat, making those ones that survive smaller. The warmer waters also mean the poor dears have become less successful at mating and reproducing.

Birds around the World

Recent research found that up to 72 percent of bird species in northeastern Australia and more than a third in Europe could go extinct due to global warming.

Birds on the Coast

Hundreds of Pacific seabirds such as common murre, auklets, and tufted puffins washed ashore last year after starving to death. Scientists blame global warming which led to less plankton, which led to fewer small fish for the birds to eat.

Birds in your Backyard

A report by the National Audubon Society found that birds such as the bobwhite and field sparrow are dying thanks to global warming, as higher temperatures mess with their migration schedules. With vital food stocks peaking earlier and earlier, many migratory birds get to the party too late and can't find enough to eat.

Death to a Snail

The Aldabra banded snail is officially extinct. Existing only on an atoll 426 kilometers northwest of the northern tip of Madagascar, the snail died out after warmer weather cut the rainfall in its habitat.

How to prevent climate change crisis-The Global warming^{[13][14]}

Get educated. Educate yourself about global warming. The more facts that you have, as to what mainstream science says about it, the more you can persuade people to make simple yet effective changes .

Join the virtual march:The Stop Global Warming Virtual March is a non-political effort to bring people concerned about global warming together in one place. Add your voice to the hundreds of thousands of other people urging action on this issue in daily behavior.

Vote and influence your government with telephone calls, e-mails, letters and meetings with those who represent you in government: Learn as much as possible about the policies that you advocate before doing so; solving one problem often creates others. For example, replacing incandescent light bulbs with compact fluorescent light (CFL) bulbs has increased the hazard of mercury contamination in homes and landfills. Fluorescent light bulbs are still preferable to incandescent bulbs (see below), but one must be careful to recycle them and to not break them, if not mercury would be released.

Plant a tree:A single tree will absorb one ton of carbon dioxide over its lifetime. Shade provided by trees can also reduce your air conditioning bill by 10 to 15%. The Arbor Day Foundation has information on planting and provides trees you can plant with membership.

Switch to green power: In many areas, you can switch to energy generated by clean, renewable sources such as wind and solar which reduces the green house gas emission. In some of these, you can even get refunds by government if you choose to switch to a clean energy producer, and you can also earn money by selling the energy you produce and don't use for yourself. Grow corn for ethanol has contributed to higher food prices while saving little energy.

Protect and conserve forest worldwide: Forests play a critical role in global warming: they store carbon. When forests are burned or cut down, their stored carbon is release into the atmosphere - deforestation now accounts for about 20% of carbon dioxide emissions each year. Conservation International has more information on saving forests from global warming.

Choose vegetarian or vegan meals: Livestock are responsible for more greenhouse gas emissions than transportation is. This is due to the large amounts of petroleum used in creating ammonium nitrate fertilizer (for the corn that they are fed) plus the cost of shipping that corn to the cattle and then shipping the cattle to slaughter and grocery. If one eats meat it should always be from a local source. Choosing vegetarian foods also drastically reduces agricultural water consumption and land use, and favorably impacts biodiversity^[15].

Recycle more by using recycling bins, and composting: Encourage neighbors, supervisors, colleagues, and businesses to do likewise.

Use compact fluorescent bulb: Replace three frequently used light bulbs with compact fluorescent bulb. A standard compact fluorescent bulb will save around one third of a tonne of greenhouse gas, along with the cost of six or more incandescent globes^[16]. Consider using even more, and give them as gifts to family and friends. Donate a set to a local charity to refit their office with compact fluorescent lights. Remember that CFL bulbs do contain small amounts of toxic mercury. Therefore, proper disposal (recycling) is necessary to prevent any additional landfill contamination. You can also start looking into LED lightbulbs which have started to crop up recently they are even more efficient.

Fill the dishwasher: In your dishwasher only with a full load. Save 100 lbs of carbon dioxide and do them by hand with minimal water^[17].

Use recycled paper.: Make sure that your printer paper is 100% post consumer recycled paper. Save 5 lbs. of carbon dioxide per ream of paper. Decide whether something is really worth printing out. Leave a signature at the bottom of your e-mails reminding the reader to think twice before printing the e-mail. Make the most of scrap paper for shopping lists, notes, scrapbooks, telephone messages, taking notes in class, etc. Recycle your paper only when it has been thoroughly used up.

Buy locally made and locally grown products: Buy locally to reduce the energy required to transport your goods. The consumable products that we all purchase represent more than half of the average family's carbon footprint! If you successfully encourage neighbors to do this, store owners will be encouraged to stock local goods. Shop at farmers' markets.

Count your carbon^[18] : There is a logo called Carbon Counted that companies can put on their products to communicate their carbon footprint. Products that have a low Carbon Counted footprint number give consumers a means by which to influence and reward companies that reduce emissions in the creation of their products.

Use a carbon calculator^[19]:These counters enable you to calculate your personal impact by adding up the carbon emissions from your activities. There are counters available for many countries; use your local search engine for results. An international calculator is provided by the World Resources Institute.

Support producers of renewable energy:Help spur the renewable energy market by participating in it. In the UK you can get 100% renewable electricity by switching to a company such as Ecotricity or Good Energy Ltd. Alternatively, you can buy wind certificates, green tags and stock in renewable energy companies. Many of these companies are new and small, and the stock is low in price. While many are high-risk, they may present an opportunity to help the company move beyond the initial stages of uncertainty and to enhance the viability of important, upcoming market niches. These companies may offer opportunities for great returns if they prove profitable; just be sure to do your homework first, as you would when investing in anything.

Buy minimally packaged goods:Less packaging could reduce your garbage significantly, saving 1,200 pounds of carbon dioxide.If you consider a certain products' packaging to be excessive, mail it to the company with your challenge to the company to reduce its packaging; include suggestions on how if you have ideas. Also tell companies that Wal-Mart thinks that reduced packaging is not only a good idea but also very achievable; this is likely to set the standard for many businesses in the future.

Insulate anything that uses energy to stay a different temperature from its environment: Keep your water heater insulated to save up to 1,000 lbs. of carbon dioxide per year. Avoid using units fitted with continuous pilot lights, and you will save 200 kilograms of greenhouse gas emissions yearly. Also use less hot water. For example, if the shower is too cold, turn down the cold water instead of turning up the hot water.Be energy wise and insulate your entire home to keep down the heating and cooling costs. If your insulation is old or inefficient, do yourself a favor and replace it; not only will it reduce your output of emissions but it will also reduce your energy bills considerably. Consider the attic, crawlspaces, basement, walls and ceiling. If you have awkward spaces, be aware that cellulose or fiberglass insulation can be blown in by a professional contractor.Weather strip your home. Caulk and weather strip your doorways, windows and air conditioners. Save 1,700 lbs. of carbon dioxide per year. You will discover that the costs of caulking are far outweighed by savings in fuel costs and increased comfort level.

Replace old appliances and reduce reliance on them:Inefficient appliances (such as refrigerators, washing machines and air conditioners) waste energy. Save hundreds of pounds of carbon dioxide per year by replacing them (and having your old appliance recycled or disposed of properly). Many countries have "energy star" ratings on new appliances that allow you to assess the energy usage of the appliance. Check online before you go shopping to save time or at least check the seals on your fridge or freezer and replace them if they show signs of wear. While you're at it, reassess appliances that you really do not need to use, such as plug-in air fresheners.

Try opening the windows instead (and throwing out that rotting fruit bowl) and replace with natural air freshener alternatives. Other items include the many so-called time-saving devices in your kitchen.

Unplug unused electronics: Even when electronic devices are turned off, they use energy. Save over 1,000 lbs of carbon dioxide per year by unplugging them or switching them off at the wall using a power surge-protector (sometimes called a power center). Get into the habit of switching the power off before you go to bed.

Move your thermostat down 2° in winter and up 2° in summer: Almost half of the energy we use in our homes goes to heating and cooling. You could save about 2,000 pounds of carbon dioxide a year with this simple adjustment.

Grow fast growing plants. Plants like bamboo grow faster and produce 35% more oxygen than trees like oak or birch, and require fewer chemicals and care. Make sure that the plants are appropriate for your area; prefer native over introduced species and do not plant problem species. Bamboo, for example, can be very invasive in most of the US.

Use public transportation: Taking the bus, the train, the subway or other forms of public transportation lessens the load on the roads and reduces one's individual greenhouse gas emissions by an average of 1600 pounds per year^[20]. Taking public transport removes the stress of long road commutes and gives you a great opportunity to read, think, and relax. You also save on parking money and time wasted looking for parking spaces.

Ride a bicycle: Taking the bike instead of the car is a very simple solution. However, if you experience such problems as lack of suitable bike paths, having to deal with congested traffic or hilly terrain, you are faced with a few challenges. They are, however, challenges that you as an individual can overcome with a little determination. Ask your local government to make more bike trails in your area and to make sure that bicyclists are kept safe from traffic in the same way that pedestrians are afforded this right. If you have hilly terrain, there are solutions as well. Build up your strength with shorter trips, find alternate routes, or take a bus part way (many municipal buses have bike racks on the front that you can use).

Use your vehicle as a tool against global warming: If you can't live without a car, then use it in a way that minimizes global impact. Buy a hybrid car.' The average driver could save 16,000 lbs. carbon dioxide per year driving a hybrid. Plug-in hybrids can save even more and one day may be able to back. Buy a fuel efficient car. Save up to 20,000 lbs. of carbon dioxide per year using a more fuel efficient car. Buying fuel efficient cars also encourage companies to continue making and improving them owing to increased demand. Practice green driving. Save gas and lower stress levels by being a considerate driver. Improve fuel efficiency by removing unused external objects such as roof racks, turning off your engine instead of idling for long periods of time (over 1 minute), and removing loads from the trunk/boot that are not necessary.

Keep your car tires adequately inflated: Under-inflated tires can reduce fuel economy by up to 3% and are subject to increased wear and tear. Check them monthly. Save 250 lbs. of carbon

dioxide per year^[20]. A good gift is a tire air-pressure gauge as it not only saves money but makes driving safer.

Change your air filter: Check your car's air filter monthly. Save 800 pounds of carbon dioxide per year. Cleaning your air filter improves your mileage and reduces pollution because it makes it easier for your car to take in air and maintain a proper fuel/air mixture^[21].

Use refills: Try using refills instead of buying new jars or bottles each time. This reduces your consumption and is usually cheaper too.

Recycle your organic waste: Around 3% of the greenhouse gas emissions through the methane is released by decomposing bio-degradable waste. By recycling organic waste or composting it if you have a garden, you can help eliminate this problem. Just make sure that you compost it properly, so it decomposes with sufficient oxygen, otherwise your compost will cause methane emissions and smell foul.

Conclusion:

Climate change is defined as a variation in climatic parameters and is attributed directly or indirectly to human activities. Such variations in climatic parameters occur in addition to or despite natural climate variability. Climate change and global warming are often used interchangeably. The global warming has brought change in climate, instability in ecology and effected economy in which we are playing an important role. So we should save our planet by preventing the global warming thereby climate change.

REFERENCES:

-
1. "IPCC AR4 SYR Appendix Glossary" (PDF).
 2. IPCC; Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.) (2007). [PDF 7.83 MB "Chapter 7. Couplings Between Changes in the Climate System and Biogeochemistry"]. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press. ISBN 978-0-521-88009-1.
 3. H. Steinfeld, P. Gerber, T. Wassenaar, V. Castel, M. Rosales, C. de Haan (2006) Livestock's long shadow. Environmental issues and options. FAO Livestock, Environment and Development (LEAD) Initiative.
 4. Cause and effect of global warming, www.time for change.org

5.http://en.wikipedia.org/wiki/Climate_change_and_agriculture

6. IPCC (2007). "Summary for Policymakers: C. Current knowledge about future impacts". *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [M.L. Parry et al. (eds.)]*. Cambridge University Press.

7. Hennessy, K. *et al.* (2007). "Chapter 11: Australia and New Zealand: Executive summary". In M.L. Parry *et al.* (eds.). *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

8. This article incorporates public domain material from the US Global Change Research Program (USGCRP) document: USGCRP (2009). "Agriculture". In Karl, T.R.; Melillo, J.; Peterson, T.; Hassol, S.J.. *Global Climate Change Impacts in the United States*. Cambridge University Press. ISBN 978-0-521-14407-0.. Public-domain status of this report can be found on p.4 of PDF

9. Anisimov, O.A., *et al.* (2007). "Chapter 15: Polar regions (Arctic and Antarctic): Executive summary". In M.L. Parry *et al.* (eds.). *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press.

10. Paul Brown (30 June 2005). "Frozen assets". *The Guardian*. UK. Retrieved 2008-01-22.

11. Mimura, N. *et al.* (2007). "Chapter 16: Small islands: Executive summary". In M.L. Parry *et al.* (eds.). *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*.

12. The top 100 effects of global warming .www.americanprogress.org

13. H:\GLOBALWARMING\How To Stop Global Warming - Articles.mht

14. H:\GLOBALWARMING\Take-Action-to-Reduce-Global-Warming.htm

15. Livestock impacts on the environment

16. Department of Climate Change (Australia), Global Warming - Cool It

17. Good Humans Guidelines.

18. Wright, L.; Kemp, S., Williams, I. (2011). "'Carbon footprinting': towards a universally accepted definition". *Carbon Management* **2** (1)61-72

19. WRI, Safe Climate Calculator

20. US EPA, On the Road: Climate Change - What You Can Do

21. Taking Action to Stop Global Warming
