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CLIMATE CHANGE AND ENVIRONMENTAL DEGRADATION

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ABSTRACT

Climate change is any long-term significant change in the climate over time, caused by nature or human activities. Climate change can be observed in terms of unpredictable rainfall patterns leading to lack of access to safe water, rising temperatures and drought leading to crop failure and food insecurity and increased likelihood of hazards, such as floods and landslides and more severe cyclones. Such types of climate change effects degrade the environment. This paper deals with climate change and environmental degradation with reference to global warming effects and causes, climate hazards, pollution and climate change, and short lived climate pollutants. This paper makes a special note on climate change impact on health coastal area ecology and ecosystem and carbon dioxide emission India. This paper points out the climate change mitigation options and their applications. This paper concludes with some interesting findings along with policy suggestions.

KEYWORDS: *climate change, global warming, climate hazards, pollution, health, climate change mitigation*

INTRODUCTION

Climate change refers to the variation in normal weather patterns caused due to pollution. The issue of environmental pollution and climate change has become an international concern due to their unfavorable affects to the physical and biological entities of the environment. The climate change phenomenon refers to seasonal changes over a long period with respect to the growing accumulation of greenhouse gases in the atmosphere. Tackling this phenomenon is of utmost importance given the pivotal role that climate plays in the formation of natural ecosystems and the human economies and civilizations on which they are based.

Recent studies have shown that human activities since the beginning of the industrial revolution – manifested in fossil fuel consumption for power generation, land deforestation for agriculture, and urban expansion – have contributed to an increase in the concentration of carbon dioxide in the atmosphere by as much as 40%, from about 280 parts per million in the pre-industrial period, to 402 parts per million in 2016, which in turn has led to global warming. Indeed, the Intergovernmental Panel on Climate Change has described anthropogenic climate change as "inevitable" in view of the numerous changes observed in the temperature of the atmosphere, oceans, and sea ice, in addition to some extensive changes in the climate cycle over the course of the 20th century. Several parts of the world have already experienced the warming of coastal waters, high temperatures, a marked change in rainfall patterns, and an increased intensity and frequency of storms. Rising sea levels and temperatures are expected to be an increasing trend. Moreover, the potential for severe and irreversible climate and environmental changes, including the continued melting of polar ice layers, such as those found in Greenland and West Antarctica, could cause sea level rises exceeding 10 meters, harmful fluctuations in ocean currents, and increased methane emissions.

The probability that most global warming of the last 15 years is the result of human actions is estimated to be more than 90%. The failure to address climate change will inevitably undermine both the world's economic and social stability. The Intergovernmental Panel on Climate Change has issued an urgent call to bring about a marked reduction in global greenhouse gas emissions and for adaption measures to respond to the effects of anthropogenic climate change.

Environmental issues such as climate change, global warming, melting of snow in the glaciers, decreasing productivity in agriculture despite technology development, etc. are neither confined to any country or continent nor is it limited to the developing or the developed world. Therefore, the United Nations and other global institutions have been paying attention towards environment management since decades. It has been realized that sustainability of the development depends considerably upon the management of the environment and hence the expenditure on environmental management today is, in fact, a compulsory investment for a safe future.

GLOBAL WARMING EFFECTS AND CAUSES

Global warming which is also referred to as climate change, is the observed rise in the average temperature of the Earth's climate system the global surface temperature is likely to rise a further 0.3 to 1.7 °C in the lowest emissions scenario, and 2.6 to 4.8 °C in the highest emissions scenario .These readings have been recorded by the "national science academies of the major industrialized nations". Future climate change and impacts will differ from region to region. Expected effects include increase in global temperatures, rising sea levels, changing precipitation, and expansion of deserts.

The planet is warming, from North Pole to South Pole, and everywhere in between. Globally, the mercury is already up more than 1 degree Fahrenheit (0.8 degree Celsius), and even more in sensitive Polar Regions. Ice is melting worldwide, especially at the Earth's poles. This includes mountain glaciers, ice sheets covering West Antarctica and Greenland, and Arctic sea ice. Sea level rise became faster over the last century. Precipitation (rain and snowfall) has increased across the globe, on average. The effects of global warming on the earth's ecosystems are expected to be profound and widespread. Many species of plants and animals are already moving their range northward or to higher altitudes as a result of warming temperatures. As dramatic as the effects of climate change are expected to be on the natural world, the projected changes to human society may be even more devastating. Agricultural systems will likely be dealt a crippling blow. A study has shown that though CO_2 can increase the growth of plants, the plants may become less nutritious. The effect of global warming on human health is also expected to be serious. An increase rise in cases of chronic conditions like asthma, are already occurring, most likely as a direct result of global warming.

Right around 100% of the watched temperature increment in the course of the most recent 50 years has been because of the expansion in the climate of greenhouse gas fixations like water vapor, carbon dioxide (CO_2), methane and ozone. Greenhouse gases are those gasses that add to the greenhouse impact. The biggest contributing wellspring of greenhouse gas is the smoldering of fossil powers prompting the discharge of carbon dioxide.

CLIMATE HAZARDS

Climate change may not be responsible for the recent skyrocketing cost of natural disasters, but it is very likely that it will impact future catastrophes. Climate models provide a glimpse of the future, and while they do not agree on all of the details, most models predict a few general trends. First, according to the Intergovernmental Panel on Climate Change, an increase of greenhouse gases in the atmosphere will probably boost temperatures over most land surfaces, though the exact change will vary regionally. More uncertain but possible outcomes of an increase in global temperatures include increased risk of drought and increased intensity of storms, including tropical cyclones with higher wind speeds, a wetter Asian monsoon, and, possibly, more intense mid-latitude storms. An increase in the frequency of floods, desertification and droughts, forest fire events is very likely. Agriculture also receives the impact of these hazards and causes economic losses of billions annually.

POLLUTION AND CLIMATE CHANGE

Pollution is the presence of a pollutant in the environment and is often the result of human actions. Pollution has a detrimental effect on the environment. Animals, fish and other aquatic life, plants and humans all suffer when pollution is not controlled. One of the greatest problems that the world is facing today is that of environmental pollution, increasing with every passing year and causing grave and irreparable damage to the earth. In some cases, air pollutants contribute to climate change, and greenhouse gases contribute to air pollution. Climate change itself may have a direct impact on air quality. Marine pollution occurs when harmful, or potentially harmful, effects result from the entry into the ocean of chemicals, particles, industrial, agricultural and residential waste, noise, or the spread of invasive organisms. Most sources of marine pollution are land based. Marine environment is adversely affected by marine pollution. The release of greenhouse gases cause the ocean to become warmer and causes the marine climate to become unfriendly resulting in damage to the marine ecosystem and marine life.

AIR POLLUTION AND CLIMATE CHANGE

Air pollution and climate change are closely related. The main sources of CO_2 emissions – the extraction and burning of fossil fuels – are not only key drivers of climate change, but also major sources of air pollutants. Furthermore, many air pollutants that are harmful to human health and ecosystems also contribute to climate change by affecting the amount of incoming sunlight that is reflected or absorbed by the atmosphere, with some pollutants warming and others cooling the Earth. These so-called short-lived climate-forcing pollutants include methane, black carbon, ground-level ozone, and sulfate aerosols. They have significant impacts on the climate; black carbon and methane in particular are among the top contributors to global warming after CO_2.

Air pollution is currently the leading environmental cause of premature death. According to the World Health Organization (WHO), approximately 7 million premature deaths annually are due to the effects of air pollution. Moreover, short-lived climate-forcing pollutants adversely affect ecosystems, including agriculture. In Europe alone, annual crops losses due to ozone are worth several billion euros. Beyond these impacts on health and agriculture, short-lived climate-forcing pollutants are responsible for roughly half of current global warming. Although all plans to minimise climate change depend critically on swift action to reduce CO_2 emissions, internationally agreed climate targets may not be achievable without additional activities to mitigate short-lived climate-forcing pollutants.

IMPACTS OF CLIMATE CHANGE ON OZONE

As per the report by US EPA (2017), ground level O3 is produced through a photochemical reaction between sunlight and precursor pollutants such as oxides of nitrogen (NOx), methane (CH4), volatile organic compounds (VOCs) and carbon monoxide (CO). Dear et al (2005), bring to attention that ozone forms on still, cloudless days, and the rate of formation is dependent on temperature as well as precursor emissions. Heatwaves are highly conducive to O3 formation. Therefore, understanding what is likely to happen to temperature, cloud cover and precursor emissions is important for making projections about the future health risks of changes in O3. Studies reviewed by Jacob and Winner (2009) find that modelled climate change will cause summertime O3 levels to increase by between 1 ppb and 10 ppb over the 21st

Century across North America, Europe and Asia, with effects being strongest in more highly polluted regions. Bell et al (2006), caution that even at low levels, exposure to O3 increases the risk of mortality, with each 10 ppb increase being associated with an increase in mortality of 0.3% (95% CI: 0.15%–0.45%).Jacob and Winner (2009), note that the extent of the projected increase in O3 depends on various factors such as the model used, the region, the climate and emission scenario and the time period. Langner et al (2005) and Tagaris et al (2007), state that in some areas where cloudiness is projected to increase and where emissions of precursor pollutants are low O3 may decrease in the future, as clouds reduce ultraviolet radiation thereby reducing O3 formation.

IMPACTS OF CLIMATE CHANGE ON PARTICULATE MATTER

In many locations around the world the relationship between climate change and particulate matter is more complex than the relationship between climate change and O3, as the various components of particulate matter are influenced by changes in meteorological variables in different ways. The main components of particulate matter are sulphate aerosols, nitrate aerosols, carbonaceous aerosols in the form of organic carbon and elemental/black carbon, sea salt and soil dust. Some of these are released directly from a source and others are formed through chemical reactions in the air. The former are called primary particulates or aerosols and the latter are called secondary aerosols or particulates. Studies suggest that the main meteorological variables likely to impact particulate matter are precipitation frequency and mixing depth. Jacob and Winner (2009), observe that particulate matter may decrease in regions projected to experience more frequent precipitation, as precipitation is the main particulate matter scavenger, with frequency of precipitation being more important than rate. Mixing depth is the section of the atmosphere where convection and turbulence cause air pollutants to mix and disperse. In regions where mixing depth is projected to increase, air pollution is likely to decrease. Projections for both precipitation and mixing depth vary by region and are often unreliable. Some components of particulate matter are affected by temperature. Liao et al (2006), Pye et al (2009), Racherla and Adams (2006), and Unger et al (2006), have found a positive association between temperature and sulphate aerosols and increasing VOCs. Pye et al (2009), report that a negative association has been found between temperature and nitrate aerosols, with higher temperatures causing nitrate aerosols to transition from the particle to the gas phase. This means that increasing temperatures may cause PM to decrease in regions where NOx emissions are high. Secondary organic aerosols can be strongly influenced by cloud processes. He et al (2013), report that the liquid water content of clouds has been found to have a strong linear correlation with the spatial distribution of organic aerosols, particularly over forest regions. This is another pathway through which climate change may potentially affect particulate matter.

CLIMATE CHANGE PARTICULATE MATTER—WILDFIRES AND DUST STORMS

Kinney (2008), and Takaro et al (2013), bring to attention that climate change will also indirectly influence particulate matter levels by increasing the frequency and severity of wildfires and dust storms in regions that are projected to be hotter and drier. Studies for the western United States show that climate change will cause particular matter concentrations to increase significantly as a result of wildfires. In this connection, Spracklen et al (2009) project that summertime surface carbonaceous particles will increase by 5 µg m”3 in the western United States in 2050 compared to 2000, where 70% of this increase is due to an increase in climate-driven wildfires. Similarly, Liu et al (2016) use a fire prediction model coupled with a global chemical transport model to project wildfire. They find that during the period 2004"2009 PM2.5 from wildfires contributes an average of 71.3% to total PM2.5 on days when PM2.5 exceeds the national guidelines. A study by Pu and Ginoux (2017) modelled how climate change will affect dust storms in the southwestern and central United States towards the end of the 21st Century under an RCP8.5 scenario. They found that reduced precipitation, increased soil bareness and increased surface wind speed would lead to an increase in dust activity from spring to autumn across the southern Great Plains (western Texas and eastern New Mexico). The studies conducted by Pu and Ginoux (2017), reveal that the northern Great Plains is projected to experience a decrease in dusty days during spring due to increased precipitation and decreased soil bareness.

CLIMATE CHANGE AND AEROALLERGENS

Climate change may also impact air quality by modifying aeroallergens such as pollens and moulds. Higher temperatures and higher CO2 levels may increase pollen production in a range of allergenic plants. It could be noted that, Albertine et al (2014) suggest that increased CO2 may cause airborne grass pollen concentrations to increase by approximately 200% in the future as a result of climate change. A study conducted by Ziska et al (2011), reveal that climate change may also cause earlier springs and warmer summers, resulting in an extension of the pollen season. In this connection, the researchers note that in North America, rising temperatures between 1995 and 2009 have resulted in an extension of the ragweed pollen season by 27 days and other potential influences of climate change on pollen production include changes in the type of species present and the growth range of species. As per the report by Kelish et al (2014), Singer et al (2005) and Wolf et al (2010), increased CO2 and drought stress may also affect the antigen production of some allergenic pollen and fungi. Albertine et al (2014), observe that ground level O3 generally has a repressive influence on both growth and antigen production. Beck et al (2013), note that it has been shown to worsen the allergenicity of some pollen such as birch pollen in Munich, Germany.

SHORT-LIVED CLIMATE POLLUTANTS

CO_2 remains in the atmosphere for a hundred years or more, so its effects on the climate are long-lasting. Short-lived climate pollutants, by contrast, have much shorter atmospheric lifetimes. Many aerosol particles such as black carbon and pollutant gases such as ground-level ozone remain in the atmosphere for only several hours to a few weeks, while methane stays in the atmosphere for about a decade. Changes in the emissions of these shorter-lived gases and particles lead to relatively rapid changes in their atmospheric concentrations. Thus the benefits of mitigating short-lived climate pollutants would materialise in a relatively short time, presenting an opportunity for quick, coordinated action to

improve both air quality and the climate. Indeed, halving air pollution by 2040 could prevent up to 45 million premature deaths.

Understanding and identifying the sources of short-lived climate pollutants and tailoring mitigation options to specific political, social and economic contexts are key challenges. Today, climate change and air quality are often addressed in separate policy arenas and at different levels. Climate change is typically addressed at international and national levels, for example, in the United Nations Framework Convention on Climate Change (UNFCCC), which focuses on the mitigation of CO_2 in particular. Short-lived climate pollutants are partially addressed by the Montreal Protocol to the Vienna Convention for the Protection of the Ozone Layer and the Gotheburg Protocol to the Convention on Long-Range Transboundary Air Pollution. Furthermore, at local and regional levels, short-lived climate pollutant emissions are tackled by local air-quality action plans or international programs with a regional focus, by the way of the Task Force on Hemispheric Transport of Air Pollution (HTAP).

CLIMATE CHANGE AND HEALTH

The impacts of climate and atmosphere on human wellbeing are critical and differed. Exposure to health hazards related to climate change affects different people and different communities to different degrees. Climate change can therefore affect human health in two principle routes: By changing the seriousness or recurrence of health issues that are as of now influenced by atmosphere or climate elements; and second, by making phenomenal or unforeseen health issues or health threats in spots where they have not previously occurred.

CLIMATE CHANGE AND COASTAL STRESSORS

Climate change can influence coastal areas in a variety of ways. Coasts are sensitive to ocean level ascent, changes in the frequency and intensity of storms, increments in precipitation, and hotter sea temperatures. Furthermore, rising atmospheric concentrations of carbon dioxide (CO_2) are bringing about the oceans to retain a greater amount of the gas and turn out to be more acidic. This rising acidity can significantly affect seaside and marine biological communities. Shoreline disintegration, coastal flooding, and water contamination, is as of now a worry in numerous ranges. Tending to the extra stretch of climate change may require new ways to deal with overseeing land, water, waste, and biological communities. Developing populaces and advancement along the coasts increase the vulnerability of beach front biological systems to ocean level ascent. Advancement can obstruct the inland relocation of wetlands accordingly of ocean level ascent and change the measure of silt conveyed to coastal regions and quickens disintegration.

ECOLOGY AND ECOSYSTEMS

Climate change is transforming ecosystems on an extraordinary scale, at an extraordinary pace. As each species responds to its changing environment, its interactions with the physical world and the organisms around it change too. Climate change is happening on a global scale, but the ecological impacts are often local and vary from place to place. Living things are intimately connected to their physical surroundings. Even small changes in the temperature of the air, the moisture in the soil, or the salinity of the water can have significant effects. Each species is affected by such changes individually, but those individual impacts can quickly reverberate through the intricate web of life that makes up an ecosystem. Shifts in species' ranges the locations in which they can survive and reproduce, and shifts in phenology the timing of biological activities that take place seasonally are the two important types of ecological impacts of climate change have been observed.

CLIMATE REFUGEES

Climate refugees are people who must leave their homes and communities because of the effects of climate change and global warming. Climate refugees, also known by dozens of other names, including environmental refugees, eco-migrants, environmental migrants and environmental displaces. Climate refugees belong to a larger group of immigrants known as environmental refugees. Environmental refugees include immigrants forced to flee because of natural disasters, such as volcanoes and tsunamis. More than 13 million Americans could become climate refugees by 2100 if the worst sea-level rise comes to pass, new research suggests environmental refugees are a particularly difficult problem for governments and policy-makers to cope with due to the variety of environmental disasters that can have dramatic impacts on the forced migration of people. Additionally, many of the state's most gravely affected by environmental disasters and resulting migration are in the developing world, meaning they may lack resources to adequately address the detrimental effects of these crises.

EXTREME EVENTS AND DISASTERS

Climate Change, disaster and sustainable development – the connections between these three seemingly different issues have become the topic for many of the national and international discussions. With the scientists debating whether this era should be named as "Anthropocene" considering the significant human impact not just on the earth's geology and ecosystems, but also on the climate, the innumerable evidences of climate change are a testimony that it is man over nature as of now. But the experiments with nature have manifested in unpredictable outcomes. One such case is that of natural extreme events. The anthropogenic climate change has now been proven to be the cause of increased extremes of heat and rainfall and the frequency and severity of the extreme events-heat waves, cold waves, floods and droughts- is likely to get worse. So much so that these events which were traditionally referred to as "Act of God" could well be referred to as spoilt experiments of the humankind.

These disasters cannot be neglected for the disturbances they cause and the effect they have on people, their incomes, their livelihoods and local business. The effect is more severe especially in the case of vulnerable sections of the society who generally live from hand to mouth and do not have the comfort of a contingency plan to fall back on. With a majority population in India being dependent on agriculture, these events of unseasonal or lack of adequate rainfall and high temperatures can destroy crops – the only asset that this section of the population has. The income for the complete year vanishes and this leads to hunger and illness. It is now recognized that when the income inequalities within and among many countries cross a threshold level, they result in heightened tension and social conflict. That is why, the concept of sustainable development also includes the clause "leave no one behind".

CARBON DIOXIDE EMISSION IN INDIA

Carbon Dioxide emission per capita and consumption of Ozone –depleting Chlorofluoro Carbons (ODP tons) is a

serious concern of environmental problems in India. Carbon dioxide (CO_2) is the primary greenhouse gas emitted through human activities. Human activities are altering the carbon cycle—both by adding more CO_2 to the atmosphere and by influencing the ability of natural sinks, like forests, to remove CO_2 from the atmosphere. While CO_2 emissions come from a variety of natural sources, human-related emissions are responsible for the increase that has occurred in the atmospheresince the Industrial revolution. As per the Key World Energy Statistics 2016, by International Energy Agency, the per capita CO_2 emission (Million Tonnes - MT) of India is 1.56 (MT) whereas the corresponding estimate for world and Asia are respectively 4.47 (MT) and 1.58(MT). In India, the per capita CO_2 emission (MT) increased steadily during 1990 to 2016. In 2016, the estimated CO_2 emission for India is 2019.67 Million Tonnes. The Carbon dioxide emission showed an increase of 246.84% in 2016 over 1990 for India whereas the corresponding increase for the World was 54.45%.

Table Change in Carbon Dioxide emissions

	1990	1995	2000	2005	2007	2008	2009	2013	2014	2016
Carbon dioxide emissions Million tonnes (Sectoral approach) - India	582.3	776.6	972.5	1160	1357	1431	1585.8	1745.06	1954.02	2019.67
Carbon dioxide emissions Million tonnes (Sectoral approach) -World	20966	21792	23493	27188	29048	29454	28999.4	31342	31734	32381

Source: International Energy Agency

PROTECTING OZONE LAYER

India, being a party to the Montreal Protocol and all its amendments, has been successfully implementing the ODS (Ozone Depleting Substances) Programme in the Country. It has set up comprehensive regulatory and fiscal measures in the Country and has also been assessing the Montreal Protocol's financial mechanism for this endeavor. The Ozone Secretariat on behalf of Parties to the Montreal Protocol awarded a certificate of appreciation and recognition to India in 2012 on the occasion of the 25th anniversary of the Montreal Protocol for its vital role in protecting the ozone layer for generations to come. As of now, the latest estimates of consumption in 2010, consumption of CFC is estimated at 290.733 ODP tonnes (ODP –Ozone Depletion Potential), down from 5614 ODP tones in 2000. From the year 2000, the CFC consumption decreased steadily till 2008, but showed minor increase in 2010.

CLIMATE CHANGE MITIGATION

Mitigation involves using new technologies and renewable energy in making older equipment more energy efficient, or changing management practices or consumer behavior. It can be as simple as improving a cooking stove design or it can be as complex as planning for new city. Government should employ a critical policy that encourages the consumer and supplier to use low carbon measures or to deal with low carbon economy. Also enhancing energy efficiency policy in power plant is the key option to improve coal dependency and to improve national economy.

CARBON CAPTURE AND SEQUESTRATION

Carbon sequestration is a set of technologies that can greatly reduce CO_2 emissions from new and existing coal- and gas-fired power plants and large industrial sources. Carbon sequestration includes: Capture of CO_2, transport of the captured and compressed CO_2 and underground injection and geologic sequestration of the CO_2 into deep underground rock formations. Carbon sequestration is important because it could play an important role in reducing greenhouse gas emissions, while enabling low-carbon electricity generation from power plants. Carbon sequestration can significantly reduce emissions from large stationary sources of CO_2, which include coal- and natural-gas-fired power plants, as well as certain industry types such as ethanol and natural gas processing plants. There are nevertheless significant drawbacks associated with reliance on geo sequestration as a major contributor to the reduction of GHG emissions in the context of climate change mitigation. A far less high-tech way is biological sequestration and it encourages organic farming practices, increased organic inputs to farm soils, and low-tillage farming systems. Not only do organically rich soils sequester CO_2, they also have higher crop yields and lower fertilizer input requirements also reducing CO_2 emissions.

The day by day increasing of global warming can be discouraging and depressing. What can one individual or one nation do on their own to slowdown and control climate change. The good news is that every individual is aware of what causes the problem and what is the remedy as well - and the technologies what we need already exist. With the right policies at national levels, we would be able to deploy them on a large scale and eradicate it. In this connection, the measures such as forego fossil fuels, infrastructure upgrade, use less transportation, stop cutting down trees and unplug the gadgets when not in use can be followed.

RENEWABLE ENERGY CONSUMPTION

Renewable energy is becoming an increasingly important issue in today's world. In addition to the rising cost of fossil fuels and the threat of climate change, there have also been positive developments in this field which include improvements in efficiency as well as diminishing prices. Renewable energy is energy that is generated from natural processes that are continuously replenished. This includes sunlight, geothermal heat, wind, tides, water, and various forms of biomass. This energy cannot be exhausted and is constantly renewed. Renewable energy plays an important role in reducing greenhouse gas emissions. When renewable energy sources are used, the demand for fossil fuels is reduced. One major advantage with the use of renewable energy is that as it is renewable it is therefore sustainable and so will never run out. Renewable energy facilities generally require less maintenance than traditional generators. Their fuel being derived from natural and available resources reduces the costs of operation. Even more importantly, renewable energy

produces little or no waste products such as carbon dioxide or other chemical pollutants, so has minimal impact on the environment.

Reducing greenhouse gas emissions is the key to solving global climate change. A major way these gases get into the atmosphere is when people burn coal, oil, and natural gas for energy. Eliminating the burning of coal, oil and, eventually, natural gas helps in reducing global warming. The easiest way to cut back on greenhouse gas emissions is simply to buy less stuff. The other solution is to be energy efficient. There is a need to think green when making purchases. Purchasing energy-efficient gadgets can also save both energy and money. Afforestation and forest management is one of the best climate change solution. Coal to gas fuel switching can also be done as a solution to climate change.

CARBON FARMING

Carbon Farming is simply farming in a way that reduces greenhouse gas emissions or captures and holds carbon in vegetation and soils. It is managing land, water, plants and animals to meet the triple challenge of landscape restoration, climate change and food security. It seeks to reduce emissions in its production processes, while increasing production and sequestering carbon in the landscape. The benefits of carbon farming include carbon sequestration, reduced erosion and soil loss, improved soil structure, increased soil fertility, reduced soil salinity, healthier soils, vegetation and animals, increased biodiversity, buffering against drought and greater water efficiency.

CONCLUSION

It could be seen clearly from the above discussion that climate change results in environmental degradation and environmental pollution. Many climate hazards are occurred throughout the world consequent upon environmental degradation, environmental pollution and lack of adequate mitigation mechanism on the part of government. Apart from the natural causes, many of the man made causes are responsible for occurrence of climate change particularly pollution caused by human economic activities, industrial activities and agriculture activities. The impact of climate change is multi dimensional in nature with reference to environment, human health, forest, biodiversity, economy, energy and eco system. Hence there is a need to mitigate the negative impact of climate change on human life support system. Mitigating climate change should be done by the way of reducing the release of greenhouse gas emissions that are warming our planet. Many mitigation strategies should be adopted such as retrofitting buildings to make them more energy efficient; adopting renewable energy sources like solar, wind and small hydro; helping cities develop more sustainable transport such as bus rapid transit, electric vehicles and biofuels; and promoting more sustainable uses of land and forests.

The most cost effective mitigation options in forestry are afforestation, sustainable forest management and reducing deforestation, with large differences in their relative importance across regions. In agriculture, the most cost effective mitigation options are cropland management, grazing land management, and restoration of organic soils. Businesses of all sizes can reduce emissions through small changes such as the use of more-efficient motors and eliminating air and steam leaks. When new facilities are built, sharing of infrastructure and utilization of waste heat would cut energy losses substantially.

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