

CLIMATE CHANGE -THE CAUSES, INFLUENCE AND CONCEPTUAL MANAGEMENT

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ABSTRACT

Climate, the integral phenomena of the earth, influences the life of ecosystem and human. A lot of factors cause the climate change meanwhile affecting the eco-human interaction. In this paper, the causes of climate change are illustrated first, and then, the effects of climate change on nature, history of dynasty change, society, economy, disease/health of human concerning our activities are emphasized. Owing to the complicated activities of human on the earth influencing the climate, the conceptual solutions and management for reducing the negative impact on climate change finally will be discussed and concluded.

Keywords: *Climate change; CO₂; Deforestation; ecosystem; Forest; Habitat; Human; Solar; Water Resources; Wildlife*

INTRODUCTION

Climate is often defined loosely as the average weather at a particular place, incorporating such features as temperature, precipitation, humidity, and windiness. A more specific definition would state that climate is the mean state and variability of these features over some extended time period. Both definitions acknowledge that the weather is always changing, owing to instabilities in the atmosphere. And as weather varies from day to day, so too does climate vary, from daily day-and-night cycles up to periods of geologic time hundreds of millions of years long. In a very real sense, climate variation is a redundant expression—climate is always varying (Stephen Jackson, 2018).

Let us see the earth system. The atmosphere is influenced by and linked to other features of Earth, including oceans, ice masses (glaciers and sea ice), land surfaces, and vegetation. Together, they make up an integrated Earth system, in which all components interact with and influence one another in often complex ways. For instance, climate influences the distribution of vegetation on Earth's surface (e.g., deserts exist in arid regions, forests in humid regions), but vegetation in turn influences climate by reflecting radiant energy back into the atmosphere, transferring water (and latent heat) from soil to the atmosphere, and influencing the horizontal movement of air across the land surface.

Climate change effects are one of the greatest crises the mankind is facing. It is a change in the weather found in a place. This could be a change in how much rain a place gets over a year or it could be a change in some place normal temperature for a month or season or change in the usual earth temperature (Fahad 2020). NASA (2011, 2019) defines climate change as: “a broad range of global phenomena created predominantly by burning fossil fuels, which add heat-trapping gases to earth's atmosphere”. These include rising trends in temperatures described by global warming but also changes such as sea level rise-ice mass loss in Antarctica, the Arctic, Greenland and mountain glaciers worldwide, shifts in plants and flowers blooming and the extreme weather events.

In general, there are basically two climate change causes- natural causes and human intervention causes (NRC, 2005; NAS, 2008). In nature: solar output, earth's orbit around the sun, changes in volcanic activity, ocean currents, and drifting of continents; while in human: greenhouse effect, a layer of gases CO₂, mainly the water vapors radiating the heat back and maintains the temperature of our planet to make capable of supporting life on this earth, CO₂ changing with climate changing; conversion of land from

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forests to agriculture, deforestation, mines, burning fossil fuels such as oil, gas, and coal releasing carbon dioxide into the air, infrastructure or urbanization for economy reasons increasing the production of CO₂ (see figure 1. the carbon cycle).

Undoubtedly, people have always been aware of climatic variation at the relatively short timescales of seasons, years, and decades. Biblical scripture and other early documents refer to droughts, floods, periods of severe cold, and other climatic events. Nevertheless, a full appreciation of the nature and magnitude of climatic change did not come about until the late 18th and early 19th centuries, a time when the widespread recognition of the deep antiquity of the earth occurred.

Earth scientists and atmospheric scientists are still seeking a full understanding of the complex feedbacks and interactions among the various components of the Earth system. This effort is being facilitated by the development of an interdisciplinary science called Earth system science. Earth system science is composed of a wide range of disciplines, including climatology (the study of the atmosphere), geology (the study of Earth's surface and underground processes), ecology (the study of how Earth's organisms relate to one another and their environment), ecology (the study of how Earth's organisms relate to one another and their environment), oceanography (the study of Earth's oceans), glaciology (the study of Earth's ice masses), and

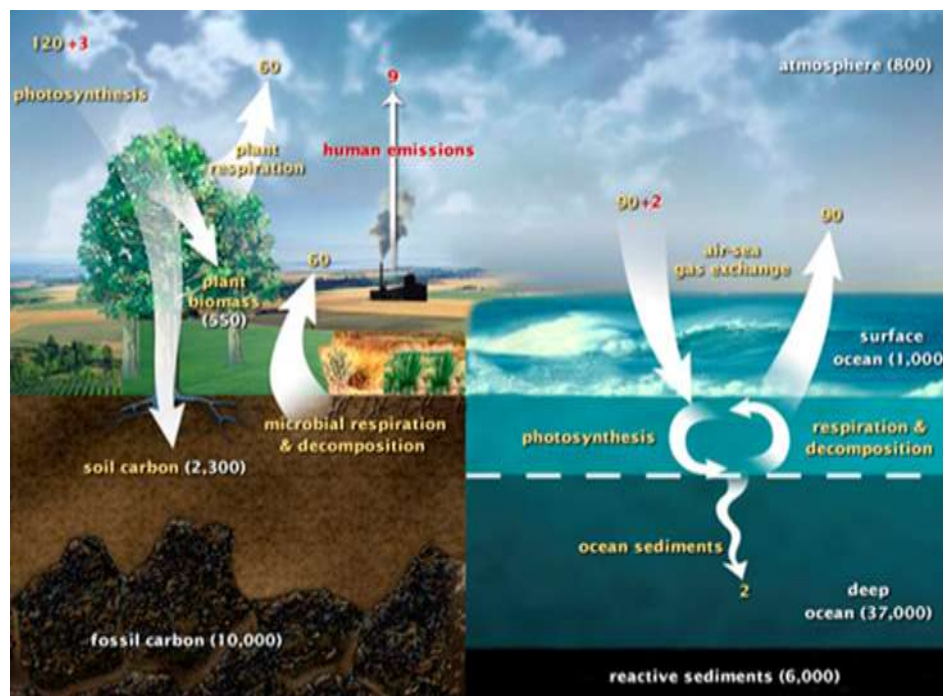


Figure 1. Carbon dioxide and the carbon cycle

ecology (the study of how Earth's organisms relate to one another and their environment), oceanography (the study of Earth's oceans), glaciology (the study of Earth's ice masses), and even the social sciences (the study of human behaviour in its social and cultural aspects).

INFLUENCE—The Effects of Climate Change

Climate change is a large risk because of the potential problems it could create in the future. Climate change can actually have many negative consequences. Something must be done to help reduce the amount of change that does not happen so quickly.

The climates of the earth these days are changing very quickly and differently. In addition, climate changes in our land affect our lives psychologically, physically and emotionally.

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1. *Some of the climate change effects in Nature* (Fahad, 2020):

Effects on Forests- Climate change effects vary in different types of forests. The semi-polar northern forests are particularly prone to be affected, with tree lines gradually falling to the north as temperatures rise. In tropical forests such as the Amazon, where biodiversity is abundant, even levels of climate change can cause high levels of extinction.

Effects on Wildlife- Global warming is the main cause of species extinction in this century. The Intergovernmental Panel on Climate Change (IPCC, 2012) says the average increase is between 1.5 degree Celsius from 20-30% of threatened species. If the planet warms more than 2 degrees Celsius, most ecosystems will fight for this. Many threatened species live in areas in the world that will be severely affected by climate change. Climate change effects are happening very quickly so many species are having problems to adapt this.

Effects in the Polar Regions- Climate change swells in Polar Regions. The northern and southern sides of the earth are crucial to the regulation of our planet's climate and are particularly vulnerable to the effects of global warming and it has global consequences.

Effects on Oceans- Climate change effects can also be seen on oceans (see figure 2). Oceans are vital "carbon pools", absorbing huge amounts of CO₂, preventing them from reaching the upper atmosphere. Increasing water temperatures and higher CO₂ concentrations than normal, making the oceans more acidic, already have an impact on the oceans.

Because of the climate change effects oceans are already undergoing extensive changes at a temperature of 1 degree Celsius, with a critical threshold of 1.5 degree Celsius and above expected. Coral reefs are expected to decrease by 70-90% at 1.5 degree Celsius. When the temperature rises 2 degrees Celsius, almost all coral reefs will be lost. It is not only a tragedy for wildlife: about half a billion people depend on coral reef fish as their main source of protein.

Effects on Freshwater- Climate change effects are severely affecting global water systems through more floods and droughts. Warmer air may contain higher water content, making rain patterns more extreme (Kijne, 2011).

Effects on the Arctic Ice Crisis- The increase in greenhouse gases increases the temperature, which can have harmful effects on the environment and the environment. The rise in environmental temperatures caused the Arctic ice to drop.

Effects on the Changes in Precipitation Pattern- Over the past two decades, precipitation, droughts, hurricanes, and floods have become more frequent. Although some areas suffer from heavy rains, there are areas that suffer from drought throughout the year.

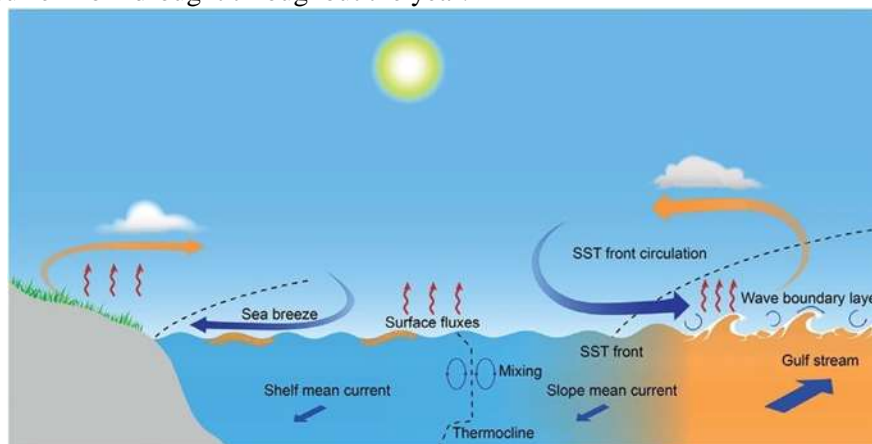


Figure 2. Ocean Current

Effects on Extreme Weather- According to the National Climate Assessment, extreme weather events will continue to increase in frequency and intensity as climate change continues to happen. Extreme

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weather influenced by climate change includes: Stronger storms & hurricanes; Heatwaves; Wildfires; More flooding, and Heavier droughts.

Effects on Habital Loss- Long waves of heat, deforestation, forest fires and high temperatures caused plants and animals to rise. Worst of all, most cannot survive due to changing climatic conditions and have moved on to more dignity (EPA, 2016).

Effects on Wildlife Loss- Forest fires, deforestation, and habitat change have caused many species to disappear, some of which have caused nausea and others have migrated elsewhere.

2. Some of the climate change effects in history:

In many historical dynasties, the influence of climate is often hidden and unobvious. The governing regime often caused the rapid collapse of entire dynasties and empires, many people think this is just a coincidence in the long river of history, but in a comprehensive view of the historical evolution of human, the rise and fall of dynasties, from famines, infectious diseases, the rise of ideological and artistic schools, and even crops, these big and small things appeared in the east and the west at some point in time, let us want to recognize how climate change affects the development of civilization.

The Rise and Fall of the Neo-Assyrian Empire: based in the floodplain of the Tigris River in ancient northern Mesopotamia (now northern Iraq), Northern Iraq was the political and economic center of the Neo-Assyrian Empire (c. 912 to 609 BCE)—the largest and most powerful empire of its time. After more than two centuries of regional dominance, the Neo-Assyrian state plummeted from its zenith (c. 670 BCE) to complete political collapse (c. 615 to 609 BCE). Earlier explanations for the Assyrian collapse focused on the roles of internal politico-economic conflicts, territorial overextension, and military defeat. Here, we present a high-resolution and precisely dated speleothem record of climate change from the Kuna Ba cave in northern Iraq, which suggests that the empire's rise occurred during a two-centuries-long interval of anomalously wet climate in the context of the past 4000 years, while mega-droughts during the early-mid seventh century BCE, as severe as recent droughts in the region but lasting for decades, triggered a decline in Assyria's agrarian productivity and thus contributed to its eventual political and economic collapse (Ashish Sinha, *et al.*, 2019). Climate change was an underlying causal factor, whose effects on the Assyrian imperial economy began centuries before the Empire's collapse. Nearly two centuries of high precipitation and high agrarian outputs encouraged high-density urbanization and imperial expansion that was not sustainable when climate shifted to mega-drought conditions during the seventh century BCE.

Megadroughts as severe as modern droughts in the region but lasting for multiple decades likely crippled the Assyrian economy and precipitated its collapse. Our data also suggest that the recent multiyear droughts superimposed over a century-long drying trend are among the worst episodes of drought in the region's hydro-climate variability during the past four millennia.

The Rise and Fall of Ancient Indian Civilization- Indus Valley Civilization (2600~1900BC) originated from the Indus Valley Domain, hence the name, is one of the four ancient civilizations and is considered the beginning of Indian history. After the civilization ended, the Aryans succeeded and created the Vedic civilization. The Indus Valley civilization is located in today's north-eastern Afghanistan, northwest India, and Pakistan. Affected by the subtropical high pressure, the climate is dry and hot, with sparse rainfall, and belongs to the subtropical dry and semi-arid climate. The year average rainfall is less than 250 mm. Affected by the unstable southwest Indian Ocean monsoon, the annual rainfall variability is large. It often causes flooding of the Indus River or drought. Impact on local irrigated agriculture is Very serious. In comparison with climate data and the trajectory of civilization development in the same period, it is still known that in the Indus River Basin, the best period of the Holocene climate created a high degree of agricultural civilization. The warm climate and abundant food made the ancient Indian civilization have a good and stable foundation for development from the beginning, and thus developed a high standard technology on urban facilities. However, two thousand two hundred years ago, the global climate was severely cold and dry. The climate caused two to three hundred years of drought and land desertification, forcing the residents of the Indus Valley to abandon their original Indus Valley is a place where people

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live, and they migrate to places with more rainfall. Food shortages, famines, and epidemics make the population large decrease in quantity and have led to the decline and death of the Indus Valley civilization.

The Rise and Fall of Roman Civilization

The centrality of nature in Rome's fall gives us reason to reconsider the power of the physical and biological environment to tilt the fortunes of human societies. In the middle of the second century, the Romans controlled a huge, geographically diverse part of the globe, from northern Britain to the edges of the Sahara, from the Atlantic to Mesopotamia. The generally prosperous population peaked at 75 million. Eventually, all free inhabitants of the empire came to enjoy the rights of Roman citizenship. Little wonder that the 18th-century English historian Edward Gibbon judged this age the 'happiest' in the history of our species – yet today we are more likely to see the advance of Roman civilization as unwittingly planting the seeds of its own demise. The paradoxes of social development, and the inherent unpredictability of nature, worked in concert to bring about Rome's demise. Climate change did not begin with the exhaust fumes of industrialization, but has been a permanent feature of human existence. Orbital mechanics (small variations in the tilt, spin and eccentricity of the Earth's orbit) and solar cycles alter the amount and distribution of energy received from the Sun. And volcanic eruptions spew reflective sulphates into the atmosphere, sometimes with long-reaching effects.

The effort to put climate change in the foreground of Roman history is motivated both by troves of new data and a heightened sensitivity to the importance of the physical environment. It turns out that climate had a major role in the rise and fall of Roman civilisation. The empire-builders benefitted from impeccable timing: the characteristic warm, wet and stable weather was conducive to economic productivity in an agrarian society. The benefits of economic growth supported the political and social bargains by which the Roman empire controlled its vast territory. The favourable climate, in ways subtle and profound, was baked into the empire's innermost structure. Climate instability peaked in the sixth century, during the reign of Justinian, work by dendro-chronologists and ice-core expert points to an enormous spasm of volcanic activity in the 530s and 540s CE, unlike anything else in the past few thousand years. This violent sequence of eruptions triggered what is now called the 'Late Antique Little Ice Age', when much colder temperatures endured for at least 150 years. This phase of climate deterioration had decisive effects in Rome's unravelling. It was also intimately linked to a catastrophe of an even greater moment: the outbreak of the first pandemic of bubonic plague. Disruptions in the biological environment were even more consequential to Rome's destiny.

For all the empire's precocious advances, life expectancies ranged in the mid-20s, with infectious diseases the leading cause of death. The highly urbanised, highly interconnected Roman empire was a boon to its microbial inhabitants. Humble gastro-enteric diseases such as Shigellosis and paratyphoid fevers spread via contamination of food and water, and flourished in densely packed cities (Kyle Harper, 2017).

The Rise and Fall of Neolithic Cultures on the Yangtze Delta- Climatic changes in the Yangtze Delta have played an important role in the emergence, persistence and collapse of civilization of water bodies that lasted for about 800 years. After this event, the civilization migrated to the region and began to reclaim the plain. At the late stage of the Liangzhu Cultures, rapid expansion of water bodies occurred. The high lake levels and high water tables caused the civilization to vanish and human settlement migrated to the higher landscapes of the western Yangtze Delta (Yu, *et al.*)

3. *Some of the climate change effects in social system:*

The social dimensions of climate change from a sustainable, equitable development perspective, understood as "an irreducible holistic concept where economic, social and environmental issues are interdependent dimensions that must be approached within a unified framework" (Metz, *et al.*, 2007), and where the overarching outcome is to fully promote human welfare and equal access to life-sustaining resources.

Some examinations on the influence of society duo to climate change are the social factors and conditions that make people and social systems vulnerable to climate change. The underlying argument is that

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climate change vulnerability is a proxy indicator for general vulnerability and lack of resilience (Füssel, 2007) as determined by socioeconomic factors and human development path ways. Understanding the socioeconomic conditions that make people vulnerable, and acting upon them, is a major part of projecting and responding to the impacts of climate change on people and societies, and one that is often missing.

The UNFCCC (United Nations Framework Convention on Climate Change, 2019.) refers to “adverse effects of climate change”, including effects on “the operation of socio-economic systems or on human health and welfare.” However, both vulnerability to climate change hazards and the impacts of those hazards on people, communities and social systems are not yet fully understood. and social systems are not yet fully understood.

The Intergovernmental Panel on Climate Change (IPCC) recognizes that vulnerability and the potential impacts of climate change are determined by the exposure, sensitivity and adaptive capacity of people and societies (Climate change, 2001). In its fourth assessment report in 2007, the IPCC noted shortcomings in its definition of vulnerability, particularly in its lack of consideration of ‘social vulnerability’, the need to address the determinants of adaptive capacity, and the need to consider human development as an essential mediator of climate vulnerability. Building on the IPCC definition of vulnerability, this section explores the factors that affect adaptive capacity and make people exposed or sensitive to climate change.

4. Some of the climate change effects in economy:

Globalization has led to the rapid development of industries, nations, and economies worldwide. Countries have become so interconnected and reliant on each other for trade, manufacturing, and procurement that issues starting in one nation may end up causing major economic impacts for a multitude of others on the other side of the world. Natural disasters can have long-lasting effects on both small and large-scale economies, often occurring randomly, and without warning, major natural disasters have been few and far between. However, as a result of climate change, certain types of disasters are becoming more destructive

and frequent and are threatening to impact the global economy (Vincent Diringer, 2020)

a. Community Damage

As severe storms and large-scale inclement weather events become more frequent due to climate change, the costs associated with repairing both the physical damage and the associated economic loss begin to take on new heights. As the impacts of climate change have worsened for the past few decades, the human and economic costs associated with environmental disasters have continued to climb, underlining the need for large-scale wide-ranging policies to be implemented to reduce carbon emissions and mitigate the effects of climate change.

b. Agricultural Insecurity

Climate change is affecting the Earth’s biota, changing weather patterns have altered farming cycles, and degraded environments are reducing the effectiveness of agricultural techniques. The impacts of climate change will be different across the world, making research into agricultural adaptation necessary on a local scale. While the issues affecting specific locations will be as diverse as the local environments themselves, a consensus has formed that the effects of climate change will severely affect food security. The effects of climate change on agriculture illustrates the inequality created by its impacts. Poorer nations will be less robust agricultural sectors, limited access to adaptive solutions, and unable to pay to upgrade their infrastructure will be left behind as larger, richer nations are able to cope with changing weather patterns and lower crop yields. Increasing temperatures and changing rainfall patterns are expected to aggravate the issues in already water-insecure areas, encouraging drought conditions and destabilizing local economies.

c. Environmental Migrants

Climate change will impact several aspects of human life, but large displacements of people have the potential to create a humanitarian crisis. The United Nations High Commission for Refugees (UNHCR)

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sees the consequences of climate change as “extremely serious”, acknowledging the dangers environmental degradation will have directly on public health as well as that of mass migrations.

Harsher climates coupled with stronger storms along with a growing lack of food and water security will drive migrants towards better-faring regions. These conditions are already a reality, with displacements of various scales recorded globally in response to major environmental disasters – however, more support is needed to efficiently manage these situations.

d. Others

Insurance, GDP, Employment, Immigration, National Security, Food Prices, etc. are all influenced by climate change.

In 2014 the U.S. Department of Defence released a report that stated climate change posed a severe and immediate threat to national security. According to former Secretary of Defence, Chuck Hagel, “Rising global temperatures, changing precipitation patterns, climbing sea levels, and more extreme weather events will intensify the challenges of global instability, hunger, poverty, and conflict.” Furthermore, climate change is likely to cause economic challenges in many parts of the world. Due to human-caused climate change, and future costs are projected to be even higher. However, putting an exact number on the real costs of climate change is difficult once you consider the staggering costs of losing natural resources like clean air and water.

The long term impact of climate change could be absolutely devastating to the planet and everyone and everything living on it. If the world continues on its current trajectory, then we will likely continue to see increasing effects on everyday life.

5. Some of the climate change effects in disease and health:

Climate change, together with other natural and human-made health stressors, influences human health and disease in numerous ways. Some existing health threats will intensify and new health threats will emerge. For example, changes in temperature and precipitation are increasing health risks associated with wildfire and ground-level ozone pollution. Rising air and water temperatures and more intense extreme events are expected to shift exposure to waterborne and foodborne diseases, affecting food and water safety. With continued warming, cold-related deaths are projected to decrease and heat-related deaths are projected to increase, and in most regions, increases in heat-related deaths are expected to outpace reductions in cold-related deaths. Climate change is also projected to alter the geographic range and distribution of insects and pests, potentially exposing more people to ticks and mosquitoes that carry the agents that cause diseases like Lyme disease, Zika, West Nile and dengue. Finally, extreme weather and climate-related events can have lasting mental health consequences in affected communities, particularly if they result in degradation of livelihoods or community relocation. The impacts on health due to climate change are both place-specific and path-dependent, meaning the impacts of climate change depend on where you are and who you are, as there are varying degrees of climate exposure and differences in individual and societal characteristics that can either protect you or make you more vulnerable to the impacts of climate change.

In summaries of CDC’s Climate and Health Program (2020), the following illustration presents some of the various health impacts that can result from changes in climate. The graphic demonstrates that rising temperatures, more extreme weather, rising sea levels, and increases in carbon dioxide levels, can cause the following environmental conditions and subsequent health impacts:

- a. Extreme heat, which can cause heat-related illness and death and cardiovascular failure
- b. Severe weather, which can cause injuries, fatalities, and have mental health impacts
- c. Changes in vector ecology, which can cause malaria, dengue, encephalitis, hantavirus, Rift Valley fever, Lyme disease, chikungunya, and West Nile virus
- d. Air pollution, which can cause asthma and cardiovascular disease
- e. Increasing allergies, which can cause respiratory allergies and asthma
- f. Water Quality Impacts, which can cause cholera, cryptosporidiosis, campylobacteria, leptospirosis, and harmful algal blooms

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- g. Water and food supply impacts, which can cause malnutrition and diarrheal disease
- h. Environmental degradation, which can cause forced migration, civil conflict, and have mental health impacts

There are many ways in which climate change could impact people's health. Depending on age, location, and economic status, climate change is already affecting the health of many and has the potential to impact millions more. According to the Center for Disease Control and Prevention, climate change-related health risks may include:

- Heat-related illness
- Injuries and fatalities from severe weather
- Sea level arising
- Asthma & cardiovascular disease from air pollution
- Respiratory problems from increased allergens
- Diseases from poor water quality
- Water & food supply insecurities

CONCEPTUAL SOLUTIONS-Reducing the Negative Impact

While the effects of climate change can seem bleak, there is still hope. By taking immediate action to curb climate change, we may never see the worst consequences. Likewise, as the world adopts cleaner, more sustainable energy solutions, there may be millions of new jobs created and billions of dollars of economic benefits. Below are some practical ways you can battle climate change, including (Earth Reminder, 2020):

- a. Give up Fossil Fuels-Purchase Renewable Energy Certificate for your home power needs
- b. Increase Your Efficiency-Make your home energy efficient. In the same way, we can install more efficient refrigerators, air conditioners and other efficient appliances. As you can reduce electricity bills by just putting something as simple as weatherproof windows in the house can reduce heating and cooling bills.
- c. These kinds of efforts can also be useful in your workplace also and will ultimately contributes to
- d. Climate change solutions.
- e. Updated Infrastructure- Energy-efficient buildings and improved processes in the cement industry (such as the use of alternative fuels for firing up of furnaces) can reduce the greenhouse gas emissions in the developed countries and can prevent them in the developing world.
- f. Reduce Methane Emissions from Fracked Gas- Reducing methane emissions is one of the cheapest, easiest and most effective things governments can do now to tackle climate change. Buy carbon offsets.
- g. Adopt a Plant-Based Diet
- h. Reduce Food Waste
- i. Recycle
- j. Stop Deforestations- This can result in ultimate climate change solutions. Improved practices combined with paper recycling and forest management (the balance of the amount of wood extracted with the number of new trees growing) can quickly eliminate such a large amount of emissions.

ARE HUMANS RESPONSIBLE FOR CLIMATE CHANGE?

The answer is “**ABSOLUTELY YES**”.

When looking at all the evidence, there is a large scientific consensus that humans are the leading cause of climate change. In their latest report, the Intergovernmental Panel on Climate Change (IPCC) stated with over 95% certainty that human activity is the main cause of global warming.

Natural climate cycles can change the temperature of Earth, but the changes we are seeing are happening at a scale and speed that natural cycles cannot explain. These cycles affect the global temperature for years, or sometimes just months, not the 100 years that we have observed. Meanwhile, longer-term changes like Milankovitch cycles and solar irradiance take thousands and thousands of years. There are lots of things

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that affect climate change, but the evidence is irrefutable. Human activity, such as burning fossil fuels and changing how we use the land, is the leading cause of climate change. Stephen Jackson, (2018) mentioned that recognition of global climate change as an environmental issue has drawn attention to the climatic impact of human activities. Most of this attention has focused on carbon dioxide emission via fossil-fuel combustion and deforestation. Human activities also yield releases of other greenhouse gases, such as methane (from rice cultivation, livestock, landfills, and other sources) and chlorofluorocarbons (from industrial sources). There is little doubt among climatologists that these greenhouse gases affect the radiation budget of Earth; the nature and magnitude of the climatic response are a subject of intense research activity. Paleoclimate records from tree rings, coral, and ice cores indicate a clear warming trend spanning the entire 20th century and the first decade of the 21st century. In fact, the 20th century was the warmest of the past 10 centuries, and the decade 2001–10 was the warmest decade since the beginning of modern instrumental record keeping. Many climatologists have pointed to this warming pattern as clear evidence of human-induced climate change resulting from the production of greenhouse gases. A second type of human impact, the conversion of vegetation by deforestation, afforestation, and agriculture, is receiving mounting attention as a further source of climate change. It is becoming increasingly clear that human impacts on vegetation cover can have local, regional, and even global effects on climate, due to changes in the sensible and latent heat flux to the atmosphere and the distribution of energy within the climate system. The extent to which these factors contribute to recent and ongoing climate change is an important, emerging area of study.

THE POLICY AND MANAGEMENT

A call for action to avoid the most severe impacts of climate change, as well as to prepare for, and adapt to, those impacts that are unavoidable. The recent report of global business leaders to the World Economic Forum states: “While some uncertainties remain in applying a risk management perspective to the available information, we conclude that a reasonable approach is for all leaders of business and government to take action now” (CEO Climate Policy Recommendations to G8 Leaders 2008). The following policies may be referenced:

A. The magnitude and direction of climate change impact on agriculture. Most of the results show that climate change, especially increasing temperature, is damaging. The effects of climate change on farmers’ net revenue per hectare is very significant. This has a policy implication worth thinking about and planning before damage occurs. Adaptation options include investment in technologies such as irrigation, planting drought tolerant and early maturing crop varieties, strengthening institutional set-ups working in research, and educating farmers and encouraging ownership of livestock, as owning livestock may buffer the effects of crop failure or low yields during harsh climatic conditions.

B. Proper deforestation and afforestation will reduce the suffering on ecosystems, forests, rivers, and lakes, by the way, the sea level arising could be controlled and the aquatic diversification in the sea might be maintained.

C. To hand out a policy on “land ethics”, such as implement of land use planning and management, setting up the guides on environmental protection and sustainable environment, practice of energy-saving and carbon-reducing life and legislation on the advanced utilization of land, is very urgent to draw attention to and effectively address environmental problems.

D. Forward-looking and diversity strategies on flood damage mitigation should be a sensitive and necessary policy for giving the people a safe and Peace of mind life with rich production.

E. If principles are too abstract or lofty ideal, the practicalities of policies also beg for the inclusion of social dimensions. Peoples and society are often silent but assumed beneficiaries of international efforts and national policies. Simultaneously, however, they are the end-users of climate technology and promulgators of climate solutions. They are also key actors in pressuring for social change, whether that be via collective social movements or individual actions. Thus, practically speaking, the success of global

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climate responses for both mitigation and adaptation can only be improved by, and may very well depend on, integration of social dimensions alongside technology, infrastructure, environmental science and other predominant considerations. It is not only the right thing to do, it is a practical necessity. Investing in human and social capital sets the stage for and maximizes the impact of adaptation interventions. Similarly, robust institutions, well informed about current and future impacts of climate change, will help people and governments to prepare, design and implement an effective response to climate impacts and increase the resilience of social institutions. Adaptation that is to benefit the most vulnerable people should therefore comprise broader developmental and resilience-building measures that empower people and reduce socially determined vulnerability as well as specific measures that reduce vulnerability to climate-related risks in the short and long term.

F. Climate change impacts will place strains on public sector budgets, particularly as the cost of infrastructure maintenance and replacement increases while economic losses due to climate change translate into lost tax revenues. Secondary effects of climate impacts can include higher prices, reduced income, and job loss. The long-term and forward-looking diversifying water resources policy, which including rational nation-land regulation, Comprehensive water control, watershed overall plan, restoration of ecosystem, diversified water resources development, reuse and recycling of water, quality control of water, virtual reservoir and water footprint, water saving and water price rational, should be presented for turning the crisis into niche and creating a true, good and beautiful water environment.

G. Reconstruction of the government system will the proper experts and strategies for facing the climate change would be an effective policy. Let professional people do professional things to achieve immediate results.

CONCLUSIONS

Humans and other species have survived countless climatic changes in the past, and humans are a notably adaptable species. Adjustment to climatic changes, whether it is biological (as in the case of other species) or cultural (for humans), is easiest and least catastrophic when the changes are gradual and can be anticipated to large extent. Rapid changes are more difficult to adapt to and incur more disruption and risk. Abrupt changes, especially unanticipated climate surprises, put human cultures and societies, as well as both the populations of other species and the ecosystems they inhabit, at considerable risk of severe disruption. Such changes may well be within humanity's capacity to adapt, but not without paying severe penalties in the form of economic, ecological, agricultural, human health, and other disruptions. Knowledge of past climate variability provides guidelines on the natural variability and sensitivity of the Earth system. This knowledge also helps identify the risks associated with altering the Earth system with greenhouse gas emissions and regional to global-scale changes in land cover.

As a conclusion, we can see there are many effects of climate changes that seriously affecting our environment, health and bio-diversities. If we still have not taken any actions to prevent the climate changes, our mother earth will be become sick more seriously. Furthermore, when the deforestation continuing occurs, there will be having many different consequences to our environment. Climate changes will also lead to psychological problem such as post traumatic disorder, stress, anxiety and violence among the communities. So, to protect our environment and give our next generation to have a better place to stay, we must always know how to prevent the climate changes such as stop cutting off the trees, save energy, car-pooling, etc. If human beings contribute to controlling the climate change effects, this world will become cool and the temperatures we currently have will fall. And if every single person will take a stand for it, this world will become a safer place to live. Therefore, let us together to protect and love our beautiful mother earth that given by God and try to keep her healthy as long as we can.

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