

## Overview on Evidence and Reality of Climate Change

Yakubu Gambo Hamza\*, Satish Kumar Ameta, Adamu Tukur,  
Abdulwasiu Usman

*Department of Environmental Science, Mewar University, Chittorgarh, Rajasthan, India*

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### **Abstract:**

*Today there is growing concerned globally, one reason that climate change becomes so widespread topic and occasionally controversial is that many people agreed it is mostly as a result of anthropogenic activities, including industrialization, burning of fossil fuel and deforestation. In contrast, others believed it can also occur due to natural phenomena, including volcanic eruption, continental drift, distance from the ocean, El Nino and La Nina.*

*To clear this doubt, this finding examines the scientific evidence on impacts of climate change on glacier melting, rising sea level, desertification, forest fire, global warming and rainfall variability. It identifies research progress and gap on how climate change accelerates the intensity of the aforementioned pressing environmental issue. Robust evidence from reviewed literature submitted that human activities associated with the release of greenhouse gases and ozone-depleting substances play vital roles in the extent to which climate change is occurring.*

*At the same time, this study analyzed and scrutinized literature of pro-climate and anti-climate change scientists (experts, politicians, public opinions) and provided fair judgment on this issue that continues attracting attention and debate. Based on the reviewed of numerous literatures, this research concurred that climate change is factual and anthropogenic activities accelerate the rate in which climate change is occurring. Thus, all hands need to be on a desk to mitigate this menace to a minimal level.*

**Keyword:** *climate change, evidence, contrarians views, reality, politics of climate change.*

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Date of Submission: 25-06-2020

Date of Acceptance: 13-07-2020

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### **I. Introduction**

Climate is an atmospheric condition of an area over periods ranging from at least three decades to thousand years. In other words, climate is average weather over a long time. Also, climate varies in different parts of the earth mostly because patterns of global air circulation and ocean currents distribute heat and precipitation unevenly from the tropics to other parts of the world (Miller and Spollman, 2010).

Numerous research, including Goddard Institute for Space Studies, Britain's Hadley Centre for Climate Change, the Japan Meteorological Agency, NASA and NOAA's National Climatic Data Center have used raw measurement data to provide records of long-term global surface temperature change. These researches reveal that Earth's average surface temperature has increased by more than 1.4°F (0.8°C) over the past 100 years, most of this increase occurred over the past thirty five (35) years. A temperature change of 1.4°F may not be consider significant when dealing about daily or seasonal fluctuation but it must be consider significant when dealing with permanent increase globally (National Research Council of the national academics, 2020).

In the same vein, scientists' research showed that for at least 2,000 years before the Industrial Revolution, atmospheric CO<sub>2</sub> concentrations were steady and then began to rise sharply during the late 1800s. Today, atmospheric CO<sub>2</sub> concentrations exceed 390 parts per million—nearly 40% higher than the preindustrial period (National Research Council of the National Academics, 2020). The study of some robust evidence of climate change in the twentieth-century in India was carried out by (Dash, 2015). The maximum and minimum temperature for the period of 1901-2003, rainfall for the period of 1871-2002 and sea surface temperature were analyzed in the study and increased trends of these parameters were noticed.

This paper attempt to study some evidence of climate change, views of scientist, public and politicians perception as well as highlighting some anthropogenic activities that may contribute to this pressing environmental issue of this century.

### **II. Methodology**

Ahmad and Ahmed (2000), IPCC (2007), NEST (2003) and Hengeveld et al., (2005) delivered indicators that one could use to assess the evidence of climate change in an area. These include rising temperature, increasing evapotranspiration, decreasing rainfall amount in the continental interiors, increasing

rainfall in the coastal areas, increasing disruption in climate patterns and increasing frequency and intensity of unusual or extreme weather-related events such as; thunderstorms, lightning, landslides, floods, droughts, bush fires, unpredictable rainfall patterns, sea-level rise, increase of desertification and land degradation, drying up of rivers and lakes and constant loss of forest cover and biodiversity.

To achieve the objectives of this research, a comprehensive literature survey was conducted by using Elsevier Science Direct (<http://www.sciencedirect.com>), springer online journal (<http://link.springer.com>), Google Scholar (<http://scholar.google.com>), CNKI (<http://www.cnki.net/>), and Research Gate (<http://www.researchgate.net>).

The main focus was on the peer-reviewed articles and government reports, other relevant non-governmental organizations reports were also reviewed, including those by Intergovernmental Panel on Climate Change (IPCC), World Health Organization (WHO), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP) and United Nations Framework Convention on Climate Change (UNFCCC). In the same vein, around 200 articles and reports were included for this review research, those publications share a focus on the evidence and divergent views of climate change

### III. Evidence of Climate Change

The evidence of climate change is becoming obvious every day near impossible for someone to doubt the adverse effects of climate change that we are experiencing on daily basis in many places, including rainfall variability, desertification, melting of the glacier, global warming, forest fire and rising sea level.

#### 3.1. Seasonal Rainfall Variability:

The conceptual basis for variation in the amount of precipitation (rainfall) was observed by (Trenberth, 1999; Allen and Ingram, 2002; Trenberth et al., 2003; Held and Soden; 2006) respectively. Other elements linked with duration, amount, distribution, intensity and distribution of precipitation, particularly when the variation is extremes as climatic condition differs from one place to another also observed.

Warming increases the rate of evaporation of soil moisture which results to dryness in soil, this may trigger the potential incidence and harshness of droughts that widely detected in several places around the world (Dai et al., 2004). However, the atmospheric moisture was carried out by the wind in the atmosphere to place where storms favored. Mostly storms covered a distance of about four times the radius of other in dimension, and collect in the water vapor, to produce precipitation (Trenberth, 1999). This may lead to a significant increase in one place and an intense decrease in other places across the globe.

A detailed summary of observed changes in precipitation is presented in the Fourth IPCC assessment (Trenberth and Dai, 2007). Schlosser and Houser (2007) and Wentz et al., (2007) observed contemporary estimates of the amount of precipitation and their developments. Gu et al., (2007) have documented worldwide and tropical rainfall variations via the global precipitation climatology project (GPCP) and discover almost-zero global variations but with significant unevenness and changes over land that opposite to the ocean. This is particularly the case for El Nino events (Trenberth and Dai, 2007).

However, based on the research by (Dash, 2015), Indian summer Monsoon Rainfall (ISMR) has decreased by about 1.6 cm between 1871-2002, in support of this fact 30 years' time scale fluctuation trends were also observed. However, decreasing trends in heavy rainfall incidents during Pre-monsoon, Post-monsoon and winter were observed across most regions of India. This could possibly contribute to drought and desert encroachment and in turn, affect the agricultural activities across the country.

#### 3.2. Desertification:

Desertification is one of greatest environmental devastation facing humanity today. It results in water scarcity, loss of biodiversity and ecosystem instability. The United Nations Convention to Combat Desertification (UNCCD) 2018-2030 Strategic Framework was set with a vision to abate, reduces, and converses desertification/land degradation and alleviates the effects of drought in areas affected and make every effort to attain a land degradation-neutral world consistent with the 2030 Agenda for Sustainable Development, within the scope of the Convention (UNCCD, 2020). According to Aston Centre of Europe (2011), Climate change is one of a number of factors that are considered to contribute towards desertification. It is crucial to note that desertification is a man-made phenomenon that is intensified by climate change as a consequence of deforestation and bush burning. The fact that reduces of annual precipitation leads to severe drought while heavy rainfall as a result of climate change will lead to land degradation and loss of vegetation cover which serves as a shield in curbing and addressing desert encroachment.

Predictable warming in this century is anticipated to be of utmost overland and at the maximum northern latitudes. In the next 20 years, a warming of about 0.2°C per decade is projected. Rises in the quantity of precipitation are expected in high latitudes, whereas decreases are expected in most subtropical land regions. In the sense that areas affected by drought will possibly increase in extent which will accelerate the rate of

desertification and land degradation (WMO, 2020). In the same vein, agricultural activities in many African regions are predicted to be harshly affected due to climate change, as areas suitable for growing agricultural products will likely be lost to the desert. In some drier areas of Latin America, climate change is projected to result in salinization and desertification of agricultural land and in some areas of southern Europe an increase of temperature and drought are projected to reduce the availability of water and crop production (WMO, 2020).

### **3.3. Melting of glacier:**

Modifications in glaciers are clear pointers of the projected climate change (Kordzakhia et al., 2016). A study carried out by Yao et al., (2012) on the glacier status of over three decades by studying the glacial retreat of 82 glaciers, area shrinkage of 7,090 glaciers and mass-balance change of 15 glaciers. Reduction in glacial status differs from one place to another, Himalayas was observed with the greatest shrinkage (excluding the Karakorum). Also, the contraction shrink from the Himalayas to the continental interior and eastern Pamir recorded the least glacial retreat, reduction of area and positive mass balance. Decreased in precipitation and rises of temperature in Himalaya and increase in precipitation in eastern Pamir are possibly resulting in these dramatic dissimilarities.

A similar study was conducted by Kordzakhia et al., (2016) which revealed that the glacier in the East Georgia area is dramatically melting as a result of the impact of regional climate change. The bulky glaciers are reducing and retreating, medium glaciers which are moderately 62 altered into small glaciers, a great portion of a small glacier are transforming into snowfields or disappear completely. About 70 % of small glaciers in East Georgia are now turned into snowfields or fully liquefied. This showed that the rate at which glacier is retreating and melting is increasing significantly due to continued changes in the climatic condition.

Shahgedavona et al., (2008) detected significant climatic warming in the higher altitude areas of the Caucasus and JJA. The discovered climatic changes can lead to a glacier retreat. This retreat is followed by the enlargement of glacial lakes. Future climate scenarios predicted that glacier retreat will continue and small glaciers at lower altitudes will be more prone to these threats and summer will be 5-7°C warmer in 2071-2100 than in 1961-1990 and that winter precipitation will experience little or no increase.

Li (2020) studied changes in a glacier during the period of 1977-2018 in the Borohoro Mountains, Tian Shan and results revealed that the area of glacier reduced from  $287.5 \pm 8.2 \text{ km}^2$  in 1977 to  $215.8 \pm 4.1 \text{ km}^2$  in 2018, at a rate of  $0.61 \pm 0.01\% \text{ year}^{-1}$ . The rate of glacier decrease was recorded high during 1994-2007 and lowest during 1977-1994. The present climatic condition of the area is significantly different from the early 20<sup>th</sup> century and both rises in mean annual temperature and precipitation were noticeably observed in the area. More so, most of the precipitation occurred during the summer which negatively affects the glacial developments.

### **3.4. Global warming:**

The maximum and minimum temperature for the period of 1901-2003, rainfall for the period of 1987-2002 and sea surface period of 1901-2003 were studied. The results of the study reveal that winter-time increase in the mean temperature over India is about 1.0°C, meanwhile, Pre-monsoon period, Monsoon and Post-monsoon period rise were observed to be 0.3°C, 0.4°C, and 1.1°C respectively (Dash, 2015). In the same vein, sea surface temperature based on the research shows a dramatic increase in trends of sea surface temperature from the period of 1901-2003.

However, an increase in temperature in most parts of the world is the greatest impact of climate change which can result in either negative or positive ecological impacts. The increasing temperature has led to increased land-based ice instability and its melting (Odjugo, 2010). The thawing of the Arctic, cool and cold temperate ice, the increased rainfall in some parts of the world and expansion of the oceans as the water warms has the greatest impact on sea-level rise, coastal flood and erosion (Odjugo, 2010).

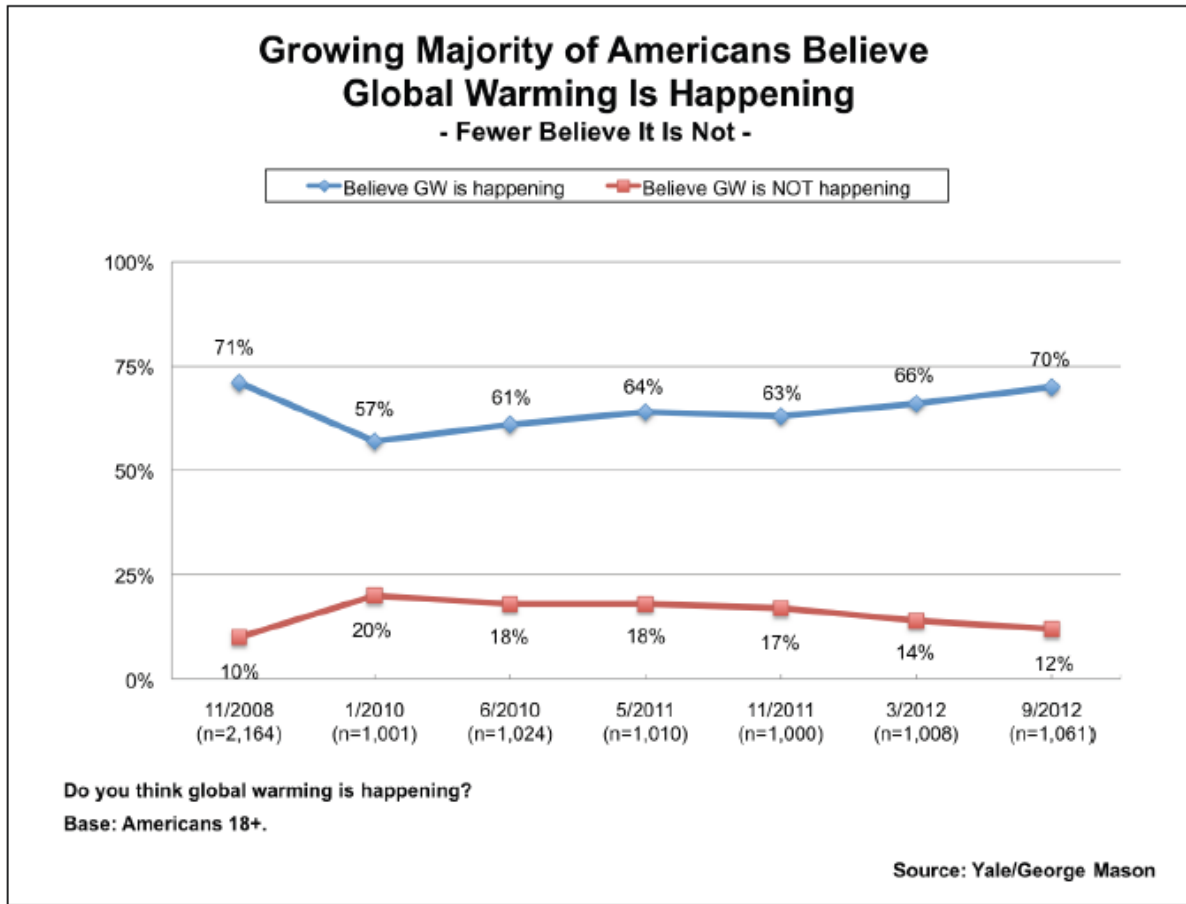


Figure 1: Americans that agree and disagree with global warming (George Mason University, 2012)

Based on the results from Figure 1, in every ten Americans, seven believe in global warming. This means that (70%) believe global warming is happening and comparatively few (12%) believe it is not while the remaining having no opinions. This showed that Americans’ belief in the reality of global warming has dramatically increased by 13 percent points (13%) from 57 percent (57%) in January 2010 to 70 percent (70%) in September 2012. Meanwhile, the number of Americans who contend global warming is not happening has declined sharply, from 20 percent (20%) in January 2010 to 12 percent (12%) in September 2012.

More so, temperature rise due to global warming can lead to a direct negative impact on public health. Serious health effects have been noticed, particularly in Europe, these include heat stress, an increase of the spreading of Lyme’s disease, effects of bad air quality (summer smog) and an increase of allergies. Some population groups are more vulnerable to this risk, including elderly people, children or asthmatic patients (Adedeji et al., 2014).

Nevertheless, a major problem facing poor nations is the absence of information and technology to tackle intrinsic climate change-induced challenges. Most of the tackling measures which includes climate change mitigation measures, adaptation strategies and vulnerability assessment may provide a viable solution if the extent of climate change elements are still unknown.

### 3.5. Forest Fire:

Forest fire is one of the environmental issues which continue attracting concern globally, it is widely believed that climate change plays a significant role in influencing the intensity of this environmental catastrophe. Forest resilience is the capability of the forest to recover to a pre-disturbance state (Gunderson 2000) and is strictly rely on abundant tree redevelopment (Johnstone et al., 2016). Both temperature and water scarcity have a negative impact on trees growing in their early life stages (seedlings and saplings) (Bell et al. 2014; Dobrowski et al., 2015), forest firmness to disturbances under warm climate remains unclear, these disturbances include wildfire (Donato et al., 2016). The continuous rise of fire activity in the western U.S and in the U.S Northern Rockies were linked by both severe droughts and increase in temperature, more especially from the year 2000 (Abatzoglou& Williams 2016; Westerling 2016). According to Flannigan et al., (2005) weather and climate are major factors influencing the rate of fire activity. The changes in climate mostly occur

as a result of anthropogenic activities, warmer weather is expected in the future which could accelerate the severity and intensity of forest fire. Even though there will be great spatial and temporal dissimilarities in the fire activity response to climate change.

Stocks et al., (1998) collected monthly data from four GCMs to observe climate change and forest fire potential in Russian and Canadian boreal forests. Forecast seasonal fire weather harshness was almost the same for the four GCMs, signifying great rises in the spatial extent of extreme fire hazard in both countries under a 2 × CO<sub>2</sub> scenario. Similarly, Stocks et al., (1998) also carried out monthly data analysis, which revealed an earlier start to the fire season and great increases in the area experiencing high to extreme fire risk in both Canada and Russia is mainly during June and July. Gillett et al., (2004) submitted the increase of regions burned by the forest fire over the last 40 years and a recent decade in Canada is due to human emission of greenhouse gases which results in human-induced climate change.

However, Flannigan et al., (2000) conducted research on the impact of climate change on forest fire by using these transient general circulation models, to be exact Hadley Centre and the Canadian GCMs, to predict fire period severity in the middle of next century. The results of seasonal severity rating (SSR) revealed that SSR will rise by approximately 10-15% within most of North America, even though there are some areas where insignificant changes or even decrease of SSR will be witnessed in the middle of next century. Thus forest fire rapidly responds to climate change.

### **3.6. Rising Sea Level:**

The sea level is rising due to a significant increase in warmer climatic conditions as a result of anthropogenic activities. The coastal region along the guinea and deltaic areas are at greater risk of experiencing erosion and flooding (Mensah et al., 2017). Therefore, the majority population living in coastal areas are facing threat from sea-level rise which affects their socio-economic development, water quality and deteriorating health condition, when care is not taking resulting in a disease outbreak.

The increasing rates of sea-level rise caused by global warming within the 21<sup>st</sup> century are predicted to accelerate flooding in a low-lying coastal environment, though the impact is more disastrous in developing nations where there is inadequate adaptation capacity. Even though (Addo et al., 2011) reported about 84% of local dwellers are aware of rising sea level but lack adapting capacity measure and also estimated that by the year 2100, possibly a range of sea-level rise in the Dansoman coastal area from model projections is between 21.2cm- 79.7cm, with 0.48km<sup>2</sup> of the coastal areas vanished by the year 2050 to permanent flood. This could force the greater displacement of people when considering the current growth of population, loss of property properties and lives.

A study on the impact of rising sea level on Australia fur seals was conducted by (McClean et al., 2018), as Australian fur seal colonies are chiefly growing in low-lying areas of rocky islands as seal have colonized these areas and prefer it as favorite habitat. But because of unprecedented global warming coupled with rising sea level which accelerating the impact of storm surges along coastlines, leads to high mortality in the Australian fur seal and the results revealed that by 2100, a 1-in-10 year storm will inundate more habitat on average than a present-day 1-in-100 year storm.

Rising of sea level will accelerate the salt intrusion in freshwater bodies, unprecedented erosion of beaches and flooding in marshes among other vital habitats, and leads to loss of property and biodiversity particularly in coastal regions (Parkinson, 2018) and also suggested that the new reality of sea-level rise and extreme weather due to climate change needs a new approach of planning and management to safeguard resources and minimize risk to humans.

The recent shreds of evidence revealed that sea level rising is presently increasing, faster than observed during the 1990s and previous decades (Cazenave and Llovel, 2010), looking at the highly devastating impact of future sea-level rise can cause, it should be a key area of research interest in climate change.

## **IV. Divergent Views on Climate Change**

There is still disagreement on the severity of climate change, possible effects, mitigation as well as adaptation strategies, besides that, there are also growing uncertainty on extent roles of anthropogenic causes to climate change and validity of models that predict climate conditions. Scientists shared divergent views on severity, causes, likely effects, and the necessity for action or inaction regarding climate change have been at the center of a U.S. policy and attract wide ranges of debate for the past several years.

Those who agree that it mainly caused by anthropogenic activities and consider it a threat to their life, environment and socioeconomic values. Keeps agitation ceaselessly for proper action to be taken and supporting their arguments with reliable information from esteemed scientific bodies like the Intergovernmental Panel on Climate Change (IPCC, 2007), the National Research Council (2007), and the Scientific Expert Group on Climate Change and Sustainable Development (2007).

Royal Society (2008) state 8 key misleading arguments of climate change using scientific evidence:

These misleading arguments include 1: The Earth’s climate is always changing and this is nothing to do with humans. 2: Carbon dioxide only makes up a small part of the atmosphere and so cannot be responsible for global warming. 3: Rises in the levels of carbon dioxide in the atmosphere are the result of increased temperatures, not the other way round. 4: Observations of temperatures taken by weather balloons and satellites do not support the theory of global warming. 5: Computer models that predict the future climate are unreliable and based on a series of assumptions. 6: It’s all to do with the Sun – for example, there is a strong link between increased temperatures on Earth and the number of sunspots on the Sun. 7: The climate is actually affected by cosmic rays. Misleading argument 8: The scale of the negative effects of climate change is often overstated and there is no need for urgent action (Royal society, 2008).

Meanwhile, contrarian rubbish the assertion that urgent action needs to be taken to control the extent of how climate is changing. This position in the recent past record a success, as public opinion polls which reveal that the public disagrees with climate change due to numerous uncertainty surrounding the issues (ABC News/Washington Post/Stanford Poll, 2007).

**4.1. The validity of Climate Models:**

The accuracy of climate change models has long been an issue of controversy in the recent climate change debate globally. Many contrarians have doubts regarding the degree and timing, cloud responses and regional details of predicted change still exist (IPCC, 2007; Schneider, 2004).

An earlier study by Vedlitz et al., (2010) reveals that climate scientists were asked about their opinions on the accuracy of climate model predictions of future climate conditions. 77% concur that climate model predictions are moderately accurate and 23% contend they are inaccurate. Similar research on the perceived accuracy of climate change modeling by Stocker (2004) reveals similar results.

**4.2. Human-caused or natural change?**

The IPCC has not only declared that climate change is a fact, but that to a significant extent it is mainly as a result of anthropogenic activities, including deforestation, industrialization and burning of fossil fuels. As such Gallup has documented Americans’ views on this issue since 2001, and the results found to be fairly stable since then (Gallup, 2008). Gallup uses this question, “And from what you have heard or read, do you believe increases in the Earth’s temperature over the last century are due more to—the effects of pollution from human activities OR natural changes in the environment that are not due to human activities? “Results of polls revealed that 58 percent gave the first response and 38 percent gave the second while 4 percent having “no opinion.”

Preliminary reviews of scientific literature and surveys of climate scientists’ researches reveal a wide range of correlation with IPCC report that human activities have been responsible for the rapid rise of Earth’s average global temperature (Oreskes, 2004).

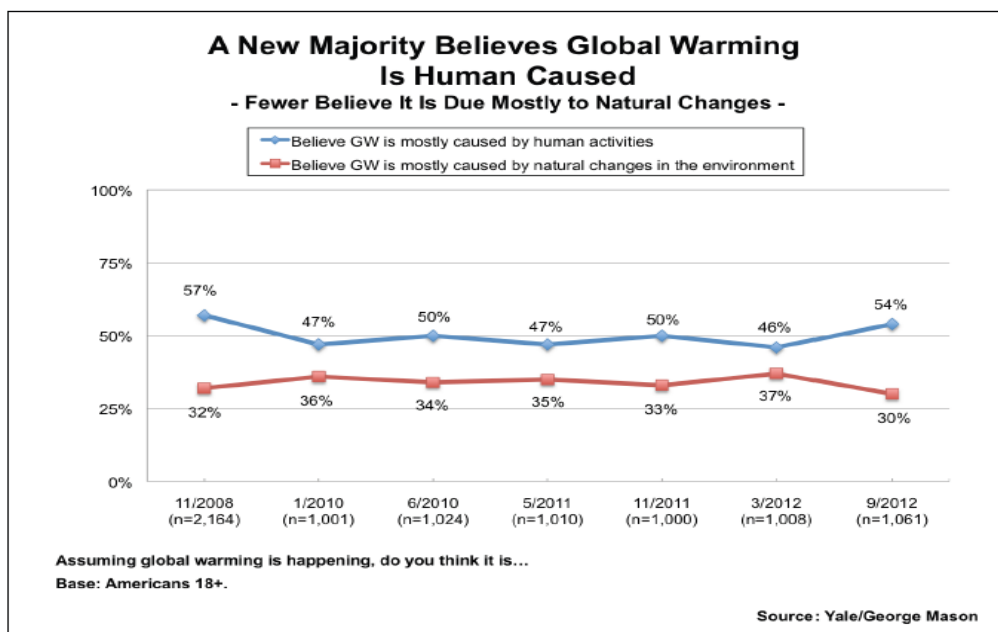


Figure 2: Causes of global warming (George Mason University, 2012)

A new majority believes global warming is human-caused. In 2008 (57%) the proportion of Americans that believe global warming is due to anthropogenic activities decrease sharply by 10 percent (47%) in 2010, at the same time, proportion dramatically increase from (47%) in 2010 up to (54%) by 2012. Whereas the proportion of those belief global warming is due to mostly natural phenomenon steadily decrease from 32% in 2008 to 30% in 2012.

Nevertheless, considerable controversy about the anthropogenic causes of climate change exists (PRCPP, 2009). In the same vein, Khan (2012) reveal some natural causes of climate change, including continental drift, variation in solar output, volcanoes eruption, variation in the Earth orbit axis, distance from the oceans, ocean currents and El Nino were among natural factors contributed to this environmental issue.

A vocal minority of researchers, activists and other critics disagree with the IPCC report and Pro-climate scientist conclusion on a possible cause of climate change (Lahsen, 2008). This group of scientist called as contrarians, skeptic or deniers have progressively receive noticeable media attention and considerable societal influences (Boykoff, 2009).

#### **4.3. Politics of Climate Change:**

Despite the robust scientific consensus about the negative impact of climate change on economic development and ecological damages are becoming serious on a daily basis. Though policymakers showed concern to these impacts but providing a possible solution to the problem turn out to be harder than many scientists anticipated (Bernauer et al., 2013). In the sense that the political determination to address global climate issues through global treaty and negotiation is very slow than how expected by many scientists to avoid future negative consequences of climate change problems.

Regardless of the growing consensus over climate change in the scientific community, as reflected in IPCC reports, sometimes this issue view from political perspectives more especially in the U.S, as Conservative congresses and Republican representatives continue to argue with one another about the reliability of scientific consensus on global warming and climate change by pinpointing the views of a modest number of skeptics or “contrarian” scientists who interrogate the IPCC’s conclusions (Hart, 2007). It seems that the intense conservative campaign against climate change (particularly IPCC’s report) and climate change advocate has significantly contributed to leaders of the Republican Party adopting a highly skeptical view on global warming and climate change (Dunlap and McCright, 2008). In the same vein, the percentage of Democrats who view the news about global warming as being exaggerated has declined steadily, from 27% in 1997 to 17% in 2008. Whereas the percentage of Republicans holding this view has increased considerably, from 37% to 59% over the same period of time. The result showed a 42% difference between supporters of the two major U.S political parties in 2008 (Dunlap and McCright, 2008).

The major hindrance to achieving long-term climate mitigation is facing considerable inconsistency and political uncertainty in long-term response approaches and adaption measures (Hovi et al., 2009). For adaptation measures, it could be local, national or regional rather than global in scope while mitigation approaches require collective global commitment.

#### **4.4. Likely Effects:**

According to Adedeji, et al., (2014) climate change is real. Super typhoon Haiyan is the recent natural catastrophe that led credence to the reality of climate change. This sad incidence hit land and devastated the Philippines (Adedeji et al., 20114). This record-breaking storm is the strongest storm in history to make landfall. Argo (2013) reported that “around 920,000 people were displaced by the storm and a total of 11.8 million people have been affected. Officials said the deadly storm left more than 3850 injured and at least 77 people reported missing across the Philippines.”

The severity of climate change effects depends on various factors associated with key vulnerabilities. These involve intensity, timing, and persistence, the potential for adaptation strategies and policy in place (IPCC, 2007). An earlier study by Vedlitz et al., (2010) reported that respondents were asked to rate Global Climate Change (GCC) as a problem affecting social, economic, and public health in the U.S., sixty percent rated GCC as a significant to a very significant problem. This correlates with IPCC reports that GCC events such as drought, cyclones, sea-level rise, heat waves, and heavy precipitation will likely (>66%) to very likely (>90%) have a significant impact on socioeconomic and general public health effects (IPCC, 2007).

Several other fear that most of the proposed solution will be costly and ineffective, some contend that everyone benefit while demanding particular countries, firms or individuals must bear the cost, will make it impossible to substantially reduce the risk of significant of GCC (Rebecca et al., 2018).

However, many business leaders consider climate change as a serious threat to their industries while several others take the advantage of it in promoting technologies that will possibly mitigate the risk of climate change by reducing the level of greenhouse gas emission (Rebecca et al., 2018).

## V. Conclusion

According to reviewed literature, climate change significantly contribute to rainfall variability across the globe, which leads to a considerable increase in one region and a serious decrease in other regions. This could possibly contribute to flooding, drought and desert encroachment.

As observed from the literature survey, desertification is one of the key evidence of human-induced climate change. Rises in the quantity of precipitation are expected in higher latitude and decrease in most subtropical regions. In the sense that areas that affected by drought will likely increase in extent which will accelerate the rate of desertification and land degradation.

The sudden and dramatic melting of glaciers is an obvious pointer of climate change. Bulky glaciers are reducing and retreating, the medium is turning into smaller glaciers while smaller are transforming into snowfield or disappear completely.

Global warming in most regions of the world is the greatest impact of climate change which results in either negative or positive ecological impact. Undoubtedly, the adverse impact of global warming is more pronounced as it accelerates the rate of glacier melting, desertification, drought, rising sea level and forest fire.

Another observation from kinds of a literature survey is a forest fire, it considers as one of environmental issue attracting concern globally, scientific evidence reveal that rise in temperature increase the intensity of forest fire.

This finding also observed that rising sea level is due to a significant increase in warmer climatic condition as a result of anthropogenic activities of ongoing releasing greenhouse gases. This could likely lead to flooding, greater displacement of people, loss of properties and lives.

Through conducting the literature surveys, it is clear that there is disagreement on severity, impact and adaptation strategies to climate change. Despite all robust evidence of climate change which is near impossible for anyone to deny but still, it suffers from lack of political will and some modest numbers of skeptic (contrarians) scientists opined that the issue is overemphasized and question the accuracy of models used to project climate change.

However, this research is in the agreement with intergovernmental panel on climate change report and climate change scientists by considering the dramatic growing number of the public that significantly believe in climate change and numerous evidence which reveal climate change is not only real but also in most cases as a result of anthropogenic activities associated with the release of greenhouse gases.

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